AVIATION WEEK
SEPT. 26, 1949
A McGRAW-HILL PUBLICATION

...e to Government Aviation Buying ...
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...me commercial airports that have recently installed or ordered L-M high intensity runway lighting

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As the pioneer in High Intensity Runway Lighting, L-M is the recognized leader, both in the quality of its equipment and in the number of major airports using this equipment. The units provide the very high intensity of 180,000 beam candlepower without glare to the pilot.

Not so spectacular but equally important is L-M Medium Intensity lighting for smaller airports and secondary runways and taxiways at large ports. These units may be purchased as part of L-M's complete airport lighting "package." This lighting is highly efficient, CAA approved, with complete control equipment, and costs as little as $1 per foot of runway.

Also available: large and small rotating beacons, obstruction lights, control panels, and auxiliary equipment. Write for literature and full information on L-M's Airport Lighting Engineering. Ask the L-M Field Engineer or write Line Material, Airport Lighting Division, East Stroudsburg, Pennsylvania.

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This new swept-wing fighter is the latest addition to the U. S. Navy's carrier-based striking force. Shipboard operation, high altitudes, and transsonic speeds demand utmost performance and dependability from its power plant.

Westinghouse is proud that its engines were chosen by Chance Vought for the "Cutlass". It is one more addition to the rapidly growing family of Westinghouse-powered airplanes for the United States military services. J-50497

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For fast action against cabin fires

THIS—

lightweight water-solution EXTINGUISHER

Here's a Kidde-designed airplane-cabin extinguisher that weighs only 7¼ pounds fully charged, including mounting bracket . . . holds more than a quart of anti-freeze water solution. No laborious pumping. Light enough for a stewardess to use easily. Approved for operation down to—40° F!

One-hand operation is simple. A twist of the handle punctures a cartridge of carbon dioxide (CO_2)—the same cartridge used in Mae West vests. Then press the thumb release. The CO_2 drives a powerful stream of water that quickly kills fires in seat cushions, blankets, paper, other carbonaceous materials.

Extinguisher is easily recharged with plain water during flight. No special tools or other equipment needed . . . just carry a couple of small spare cartridges of CO_2.

Light, compact, sure in action, here's the ideal extinguisher for airplane cabins. It's attractively finished in a pastel shade to blend with cabin interiors. Lightweight brackets are included. Get the full facts!

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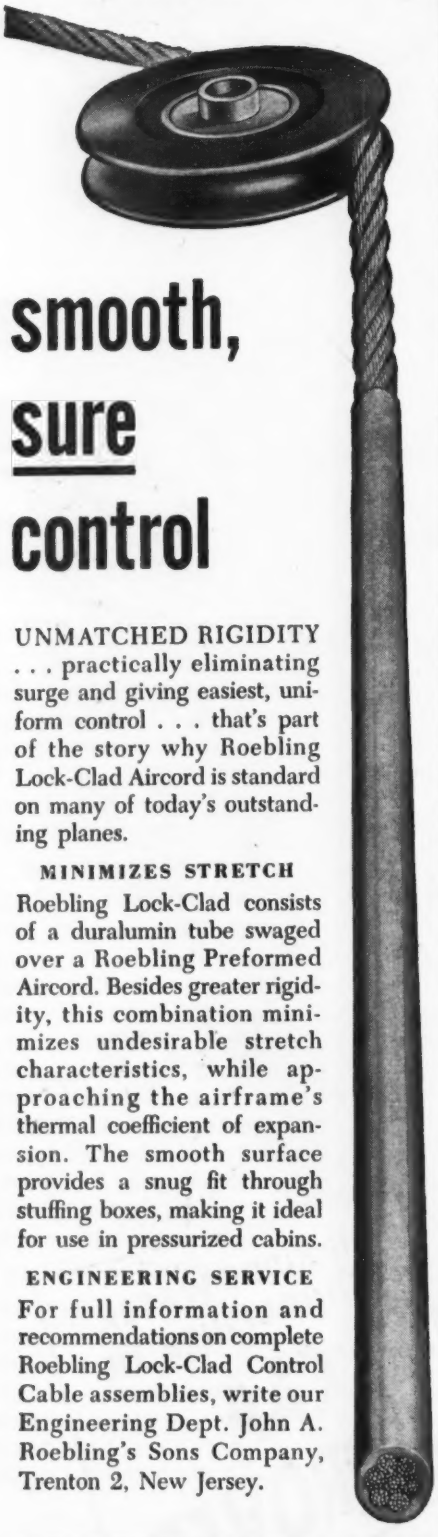

smooth, sure control

UNMATCHED RIGIDITY . . . practically eliminating surge and giving easiest, uniform control . . . that's part of the story why Roebling Lock-Clad Aircord is standard on many of today's outstanding planes.

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Roebling Lock-Clad consists of a duralumin tube swaged over a Roebling Preformed Aircord. Besides greater rigidity, this combination minimizes undesirable stretch characteristics, while approaching the airframe's thermal coefficient of expansion. The smooth surface provides a snug fit through stuffing boxes, making it ideal for use in pressurized cabins.

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For full information and recommendations on complete Roebling Lock-Clad Control Cable assemblies, write our Engineering Dept. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

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Vol. 51, No. 13

AVIATION WEEK

September 26, 1949

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Aviation Week is indexed in "Reader's Guide to Periodical Literature", "Engineering Index" and "Industrial Arts Index". Publications combined with AVIATION WEEK are AVIATION, AVIATION NEWS, AIR TRANSPORT, AERONAUTICAL ENGINEERING and AIRCRAFT JOURNAL.

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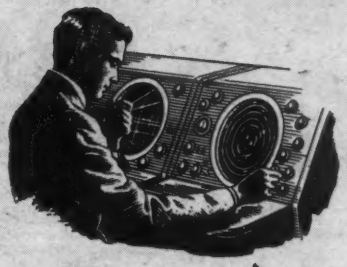
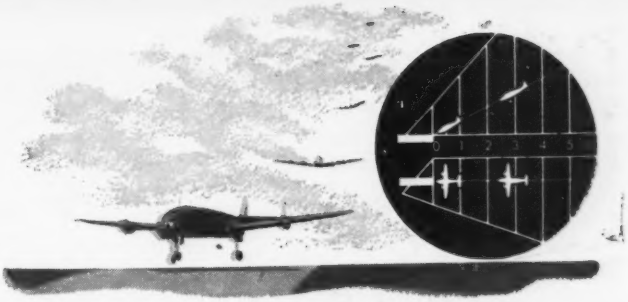


GCA speeds up IFR Traffic 300%

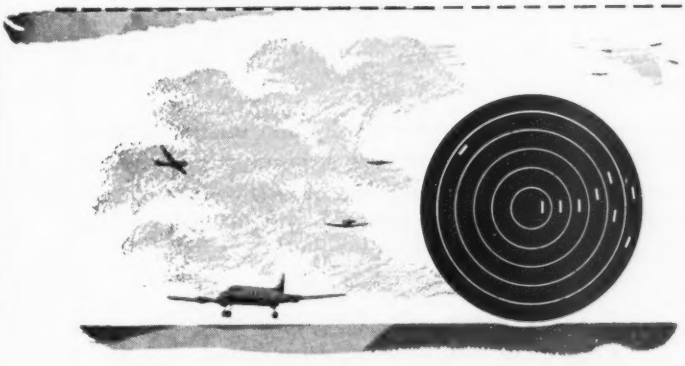
Los Angeles Municipal Airport is closed or "on instrument" 20% of the time. During this bad weather period, the airport operates at only 60% efficiency. When a $20,000,000 airport functions at only 60% efficiency, the airlines, air passengers and the taxpayers stand the loss. One airline conservatively estimated it lost $200,000 at one airport during a 90-day period because of bad weather. And this does not consider the incalculable loss of passenger goodwill resulting from schedule irregularity.

To master bad weather and its costs, GCA is being installed at L. A. Municipal Airport and 82 other airports across the nation. GCA is both a fail-safe, precision radar landing system and a great factor in air traffic safety, operation and efficiency. GCAirports can operate near 100% efficiency in all weather. With GCA, airlines can be on schedule with safety... and with profit.

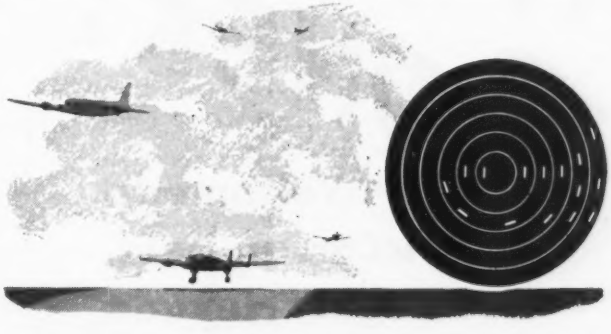


GCA Unstacks Aircraft a Minute Apart—4 Times Present IFR Limits. At most airports, CAA IFR procedure permits aircraft to unstack at 4 minutes minimum spacing. With GCA's precision scopes showing each aircraft's position in 3 dimensions, the new CAA Radar Procedure Manual permits unstacking at 1 minute spacing . . . 4 times as fast with GCA. Actually, with GCA, stacks seldom develop, because GCAirports handle IFR traffic with clear weather speed and safety.

GCA Speeds Up IFR Landings and Take-Offs 300%. In IFR weather, once an aircraft reports over the Downey marker on final approach at Los Angeles, all take-off aircraft are held. At time of report, the landing aircraft is 5 minutes – 15 miles – from touchdown. And should the landing aircraft miss first approach, present practice at Los Angeles keeps the take-off aircraft grounded until a successful approach and landing is made. With GCA, planes can take-off until landing aircraft is within 1 minute – 3 miles – from touchdown.



GCA Isolates Rogue Aircraft. When an unidentified aircraft flies into a crowded airport area, GCA spots its position immediately. Unidentified "rogue" aircraft accidentally flying off course into the Los Angeles Airport area could conceivably disperse a dozen large transports at incalculable cost and jeopardy. GCA's high powered search scopes bring the rogue under control at once, and any danger of collision is eliminated.



GCA Eliminates Costly Turn-Backs and Safety Climbs. In IFR weather, the bogey of all pilots is the tedious, time-wasting climb to avoid stacks and other aircraft. Departing aircraft must fly "over the top"—sometimes 14,000 feet—before proceeding on course. With GCA, departing aircraft must keep only a 3-mile horizontal distance from other aircraft. They can because tower GCA gives them the relative bearing and distance of other aircraft. Also, departing aircraft under GCA surveillance take off 1 minute apart – 3 times present CAA limits.

PIONEER DEVELOPER AND MANUFACTURER OF GCA FOR THE USAF AND CAA

GCA Gilfillan LOS ANGELES

ALAMO AIRWAYS, Las Vegas, Nevada, under the able guidance of Peg and George Crockett, greets fliers with a hearty "Howdy, Podner!" and sees that service rendered is the kind that brings folks back for more. Note the Texaco truck. The Crocketts know that quality teamed with service pays dividends.

Howdy, Podner!

Welcome to McCarran Field, Las Vegas, Nevada

Alamo Airways offers a friendly greeting, superior service and Texaco Products.

Fliers who land at Alamo Airways comment on the unusually fine service they get. There's a "Follow Me" jeep to guide them to the service line . . . a completely equipped chart room . . . attendants are prompt, courteous and competent. And Texaco Aviation Lubricants and Fuels are sold exclusively . . . have been for more than ten years.

It's this combination of quality service and quality products that builds business for progressive airports everywhere. On the skyways as on the highways, the Texaco name and trade mark are recognized symbols of the finest in lubricants and fuels. In fact—

More revenue airline miles in the U.S. are flown with Texaco Aircraft Engine Oil than with any other brand.

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TEXACO Lubricants and Fuels
FOR THE AVIATION INDUSTRY

AVIATION WEEK

A Message to the Aviation Industry

By Louis Johnson

The Secretary of Defense

Getting business from National Defense is a selling job. You know far better than I that its main points are knowing what the customers want, how and where they buy, and then showing how your product fills their needs, when and where they exist.

The salesman who performs those functions, be he owner, employee or bona fide sales agent of a manufacturer, is always welcome because he renders a valuable service to the National Military Establishment.

But there are others who prostitute the profession of salesmanship, who seek to convince the small businessman that only by buying through them can he get orders from the government. To the small businessman I must emphatically say, "That is not so. There is no need for special brokers, for 15 percenters, for 10 percenters, for even 5 percenters. There is no need for anyone to intervene between small business and the government to procure government contracts."

And to those who claim to sell "influence at the right spots" I say, "We will drive you out of the National Military Establishment!" And let those who engage in questionable brokerage activities heed this warning!

Let me repeat: There is no need to have any broker between small business and the government to procure government contracts. Ignorance and uncertainty on the part of the businessman as to how he should proceed or whom he should see in the government when he is trying to sell his products have beena basic cause for his succumbing to the blandishments of the five percenter.

The Military Procurement Information Center, which I have directed the Munitions Board to establish, will help any interested businessman overcome his ignorance of how the Departments operate and dispel the fog of uncertainty as to who buys what and where. Copies of all invitations to bid, abstracts of bids, and other pertinent documents will be available at this office, except when security precludes.

We will carry out an indoctrination campaign within the Departments to help correct any of the misconceptions regarding small business and to see to it that "brush-off" or "run-around" tactics are not used. Individual cases of alleged discrimination against a firm because of its size, if brought to the attention of the departments, will be investigated.

We are not intending to open the gates to a flood of inquiries or complaints from unsuccessful bidders who have been afforded equal opportunities with their competitors. But carefully documented complaints, either individually or on a sampling basis, will be checked to determine ways and means of correcting or improving procedures.

Model CP-450-EA

new!

CP HOT DIMPLER

for hot dimpling of magnesium and the harder aluminum alloys

In dimpling magnesium and the harder aluminum alloys, the application of heat is recommended to eliminate cracked dimples.

Developed for this type of work, the new CP Hot Dimpler incorporates Zephyr coin edge dimpling punches and dies which insure accurate nesting of dimples. Write for detailed information on the new CP-450-EA hot dimpler.

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AIR COMPRESSORS • AIRCRAFT ACTUATORS
PNEUMATIC and PNEUDRAULIC RIVETERS
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AVIATION CALENDAR

Sept. 26-28—National Electronics Conference, Edgewater Beach Hotel, Chicago.

Sept 27-30—1949 fall meeting, American Society of Mechanical Engineers, Hotel Lawrence, Erie, Pa.

Oct. 3-8—Twentieth aniversary meeting, Ninety-Nines, Waldorf-Astoria, New York.

Oct. 4—Committee on Aviation and Airport Fire Protection of National Fire Protection Assn. meeting, Wings Club, Hotel Biltmore, New York City, 10 am.

Oct. 5-8—SAE national aeronautic meeting and aircraft engineering display, Biltmore Hotel, Los Angeles.

Oct. 7-8—American Air Mail Society, exhibition and convention, Edgewater Beach Hotel, Chicago.

Oct. 8—"Cradle of American Aviation Day," opening Nassau County Golden Anniversary Industrial Exposition, Roosevelt Field, L. I., N. Y.

Oct. 12-15—Air Reserve Assn. convention, Long Beach, Calif.

Oct. 13-15—1949 conference on airport management and operations, sponsored by University of Oklahoma and Southern Flight magazine, Norman, Okla.

Oct. 13-15—Eighth Annual Convention, Air Line Dispatchers Assn., Congress Hotel, Chicago.

Oct. 17—Fall meeting, New York State Aviation Council, Hotel Syracuse, Syracuse, N. Y.

Oct. 17—36th NASC steering committee meeting, Dayton, O.

Oct. 17-18—Fall meeting, American Society for Testing Materials' Committee D-4 on adhesives, ASTM headquarters, 1916 Race street, Philadelphia, Pa. Non-members invited.

Oct. 18-19—6th NAS council meeting, Wright-Patterson AFB, Dayton, O.

Oct. 30—Third annual San Francisco Air Fair, sponsored by Junior Chamber of Commerce, San Francisco Airport.

Oct. 30-Nov. 2—Annual convention, National Assn. of State Aviation Officials, New Orleans.

Nov. 9-11—Seventh annual meeting Aviation Distributors and Manufacturers Assn., French Lick Springs Hotel, French Lick, Ind.

Nov. 30-Dec. 2—Annual meeting, Society for Experimental Stress Analysis, Hotel New Yorker, New York.

Jan. 13-15, 1950—All-American Air Maneuvers, Miami.

Mar. 6-9, 1950—47th annual meeting, American Road Builders' Assn., Netherlands Plaza Hotel, Cincinnati.

Mar. 28-31, 1950—National Plastics Exposition, sponsored by Society of the Plastics Industry, Navy Pier, Chicago.

April 16-20—Annual business meeting, American Assn. of Airport Executives, Neil House Hotel, Columbus, Ohio.

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NEWS DIGEST

DOMESTIC

Chicago and Southern Air Lines has ordered five L-649A Lockheed Constellations at a cost, including spares, of $5-6 million. Planes will be delivered next August and will be used on route from Chicago to New Orleans and Houston, and internationally to Caracas, Venezuela, via Cuba and Jamaica.

Air Materiel Command plans three new shifts in top jobs, in addition to those disclosed earlier (AVIATION WEEK, Sept. 19). Maj. Gen. St. Clair Streett becomes deputy commander. Maj. Gen. F. M. Hopkins, Jr., moves from chief of industrial planning to succeed Maj. Gen. Orval R. Cook as deputy to the AMC commander for operations. Brig. Gen. A. H. Johnson becomes new chief of industrial planning under Cook. Johnson previously had been deputy to Cook in the operations office.

California Eastern Airways has elected Samuel J. Solomon president. He succeeds Andre De Saint-Phalle who was named chairman of the board and who will continue as chief executive officer. One of the founders and former president of Northeast Airlines, Solomon also headed Atlantic Airlines, pioneer applicant for an air coach certificate. Cal Eastern is seeking a coach-type certificate from CAB.

First B-36 crash was being investigated by Air Force, with no early indication of cause. Plane failed to take off from Carswell Air Force Base and plunged into Lake Worth, killing five crewmen.

Air Cargo, Inc., the certificated airlines' ground service organization, elected Adm. Emory S. Land president and a director to succeed Fred M. Glass, who resigned recently. Land will continue as president of the Air Transport Assn., and Emery F. Johnson, secretary of Air Cargo, Inc., was named general manager, responsible for active management.

Luscombe Airplane Corp. creditors will meet Oct. 4 at the Federal Bldg., Dallas. Creditors of the bankrupt firm have been advised of an offer to purchase 345 acres of Luscombe property at $300 an acre, contingent on approval of creditors and the bankruptcy referee.

Martin XB-51, ground support bomber powered by three jet engines, was announced by the Air Force and Glenn L. Martin Co. Span of the swept-back wings is approximately 55 ft., and the length is about 80 ft. Horizontal tail surfaces are swept back and mounted atop vertical tail. Two GE J-47 engines are on pylons on each lower side of fuselage near the cockpit, with the third in the rear of the fuselage.

Piasecki Helicopter Corp. announced receipt of letter of intent from Navy for seven HUP-1 shipboard helicopters. The five-place craft formerly was designated XHJP-1.

The Helioplane, quiet, low-landing-speed plane developed by Otto C. Koppen and Lynn Bollinger, will be produced next year in a four-place version, the originators have announced. Koppen and Bollinger have abandoned plans to certificate and build two-place models. The Helio Corp. will not manufacture the plane, but production plans have not otherwise been decided.

First fixed base operator has been named to CAA's Airport Advisory Committee (AVIATION WEEK, Aug. 1). He is John H. Burke, owner and operator of the Wiley Post Airport, Oklahoma City.

Milton Reynolds-Bill Odom aeronautical fellowship fund has been established at Stanford University to set up five fellowships for Stanford aeronautical engineers. Reynolds, Chicago manufacturer who sponsored Odom's 1947 round-the-world flight, made an initial contribution to the fund, as did the Chicago section of the American Society of Mechanical Engineers.

FINANCIAL

Continental Motors Corp. reports earnings of $1,701,005 on sales of $58,693,391 for nine months ending July 31.

Texas Engineering & Mfg. Co. declared regular quarterly dividend of 10 cents a share on common stock, payable Sept. 29 to holders of record Sept. 23.

INTERNATIONAL

Italian Flyers John J. Brondello and Camillio Barioglio were missing on a flight from the Azores to New York in a single-engine Beech Bonanza. Pilots last reported 940 miles east of New York.

Canadian Car and Foundry Co., Montreal, is believed to have arranged to convert Canadian-owned DC-3s into the Super DC-3 developed by Douglas Aircraft Co.

Middle East Airlines, Lebanese carrier, has given Pan American Airways a 36 percent stock interest in exchange for three DC-3s, materials and equipment. Middle East, operating for more than three years, flies between Beirut, Cairo, Damascus, Baghdad and Nicosia.

International Air Transport Assn. elected Warren Lee Pierson, TWA board chairman, as president for 1950.

From the beginning of aviation, S.S.White flexible shafts have been used in practically every type of plane, including bombers, fighters, transports, air liners and even gliders.

Their superior performance and dependability have been conclusively proved on a wide variety of applications, including remote control of radio, direction finding and radar equipment, gyro pilots, trim tabs, bank indicators, air scoops, etc. and power driving of tachometers, tach generators, fuel pumps, cowl flap mechanisms, starters, windshield wipers, etc. Many of these flexible shaft combinations, now standardized for aircraft, fully meet Army and Navy specifications. They are available in lengths to order. Also widely used in aircraft are S.S.White ACTUATORS for operation of trim tabs, etc. and ADAPTERS for connnecting flexible shafts in cramped space.

FLEXIBLE SHAFT HANDBOOK—FREE

260 pages of information and engineering data about flexible shafts and how to select and apply thm. Copy free if you request it on your business letterhead. Write for a copy today.

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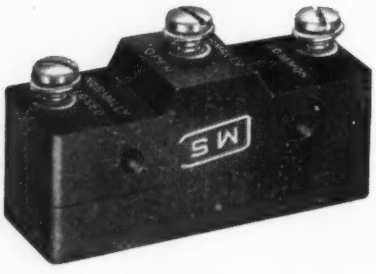
THE S. S. WHITE DENTAL MFG. CO.

Dept. V, 10 E. 40th St.
New York 16, N. Y.

MICRO SWITCH Improves BZ-R31 Switch

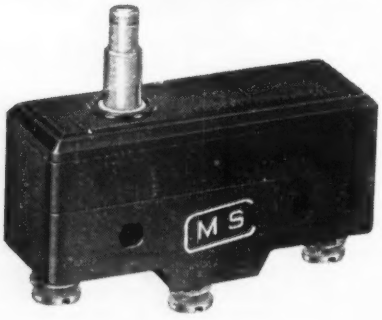
(AN 3210-1)

Molded Insert Terminals of Revised BZ-R31



View showing terminals of new design of MICRO BZ-R31 (AN3210-1) switch. Note the better wiring space . . . also that the troublesome separator is no longer required.

Improved MICRO BZ-7RST (AN3215-1)

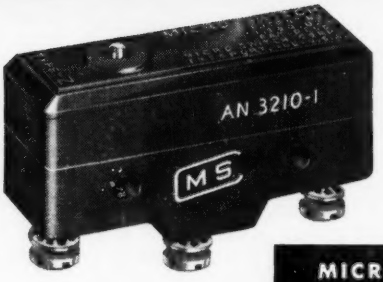


MICRO "S" plunger switch with same new design of terminals as BZ-R31.

Improved MICRO BZ-3YT (AN3216-1)

MICRO split contact switch has also been improved with molded insert terminal construction.

NEW



MICRO . . .
First name in precision switches

Improved form of MICRO BZ-R31 (AN3210-1) switch; full interchangeability with all MICRO BZ-R31 (AN3210-1) switches of earlier design.

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Vol. 51, No. 13

AVIATION WEEK

Sept. 26, 1949

U. S. Aviation Budget Sets Peacetime High

With more than $7 billion in fiscal 1950 funds, the industry can look to busy days.

A record peacetime aviation budget of more than $7 billion for fiscal year 1950 for the U.S. military services promises busy days ahead for the aircraft manufacturing industry and its related equipment and accessory manufacturers.

Once again the two biggest customers of aviation are:

• **U.S. Air Force,** with a minimum budget of $5,415 million which may be boosted another $800 million before Congress adjourns.

• **U.S. Navy,** with an aviation budget of $1,618 million already agreed upon by Congress.

A minimum of $3.5 billion is scheduled for procurement of military aircraft and related equipment by the two services in fiscal year 1950.

And if the House should prevail in the current House-Senate conference argument over additional Air Force allocations, that $3.5 billion would be increased to approximately $4.2 billion for aircraft procurement.

Analysis of the minimum 1950 fiscal year Air Force budget shows Congress approval is certain for at least a $5,415 million total budget, which would include $2,515 million for aircraft procurement. Of this, $1,630 million is actually available for fiscal 1950 expenditure and contract obligation, since USAF must subtract $875 million already due against previous obligations.

▶ **More Money Possible**—If the House succeeds in adding the additional $800 million for USAF, it is expected approximately $700 million would go for aircraft procurement. Total USAF budget for aircraft procurement would be over $2.3 billion.

Of Navy's total aviation budget of $1,618 million, $1,099 million is earmarked for aircraft and related procurement. From this amount, $681,546,000 is actually available for fiscal 1950 aircraft expenditure and contract obligation, since Navy also has made advance commitments totalling $418 million which must be subtracted.

As approved by the Senate, funds would be available to buy a total of 2512 aircraft or 34 million airframe lb.

Funds would be available to buy the two services a total of:

• **2512 aircraft** or 34 million airframe lb. if the Senate budget wins out, or

• **3393 aircraft** or 50 million airframe lb. if the House budget version carries.

Air Force would get authorization to buy 1669 planes (25 million airframe lb.) under the Senate budget, or 2550 planes (41.8 million airframe lb.) under the House budget.

Navy in either case stands to get 843 aircraft (9 million airframe lb.).

▶ **USAF Plans**—USAF staff headquarters has kept a tight seal on its detailed budget planning for the extra procurement funds it might get if the House wins the budget argument. All but about $50 million of it is expected to go for more fighters, light bombers and trainers.

Figures on the major portion of USAF's aircraft procurement plan for fiscal 1950 however show the following tentative distribution for planes and spares:

Bombers	$713,031,148
Fighters	$346,098,127
Transports	$237,588,462
Trainers	$99,721,032
Others	$29,631,292
Prior Years' Items	$26,236,939
Special Modifications	$27,693,000
Total	**$1,480,000,000**

This table leaves unaccounted about $200 million out of the $1,680 million available under the Senate budget.

In addition to the "aircraft and related material" budget classification are other USAF budgeted equipment purchases, including $115 million for electronic equipment; $15 million for guided missiles and special material; nearly $17 million for industrial mobilization; $120 million for aircraft maintenance supplies and equipment; $158 million for aircraft fuel and oil; $25 million for special air force equipment; $11 million for flying field and hangar equipment.

▶ **Navy Plans**—Navy's plane buying program for fiscal 1950, already well crystallized, calls for spending $662,782,500 for:

608 Fighters
134 Attack Planes
51 Patrol Bombers
5 Transports
35 Helicopters
10 Trainers
843 Planes

Other Navy aviation equipment purchases which are budgeted include such items as replacement of navigational and radio equipment for aircraft in service, aerological, photographic and miscellaneous equipment including repairs, $25 million; pilotless aircraft, $13 million; industrial mobilization $3,900,000.

▶ **R and D Spending**—For aviation research and development USAF proposes to spend $215 million while Navy has budgeted $80 million for fiscal 1950.

Maintenance and operation of aircraft (including reserve and ANG planes) calls for a USAF budget figure of $495 million and a Navy budget figure of $182 million.

Total Air Force-Navy program as approved by the Senate falls well below the minimum annual production rate of 3000 planes recommended by the Air Coordinating Committee but airframe weight is slightly above the 30 million lb. minimum set by ACC. But if the House budget gets approval, total airframes (3393) and the airframe pounds (50 million) would be well above the minimum.

▶ **Neither Hits Mark**—In neither case would the number of planes or the airframe weight approach the 5700 planes with 60 million lb. weight required by ACC for an immediate prewar period.

For the size 1950 aircraft program contemplated, aircraft metals and other materials are not expected to be critical, and the installation of new equipment at some of the plants under the healthy production of 1948 is expected to make machine tools and other plant equipment more readily available.

Powerplants, one of the causes for some production slowdowns through fiscal 1949, are expected to fit into schedules better this year.

Estimated Government Aviation Obligations Under 1950 Fiscal Year Appropriations

1948 Grand Total—$3,721,062,466; 1949 Grand Total—$3,156,877,066; 1950 Grand Total—$4,658,535,107.

Below are obligations contemplated under 1950 fiscal year budget estimates. Air Force's budget estimate totalled $5,465,887,000 in cash and contract authorization; the House voted $6,215,709,000; the Senate, $5,465,887,000. BuAer's budget estimate of $1,618,667,000 in cash and contract authorization has been approved intact by the House and Senate. Of CAA's budget estimate of $218,183,500 in cash and contract authorization, $206,548,605 was ultimately enacted. Of NACA's budget estimate of $85,200,000 in cash and contract authorization, $63,000,000 was ultimately enacted.

U. S. Air Force

	1948 (actual)	1949 (estimated)	1950 (estimated)
Aircraft and related material	$1,560,423,015	$777,191,629	$1,630,000,000
Electronics equipment	49,518,875	53,298,786	115,000,000
Guided missiles and special material	12,111,712	26,874,499	15,000,000
Industrial mobilization	5,220,701	6,357,544	16,912,880
Special procurement (weapons, vehicles, etc.)	8,903,734	22,258,750	126,139,000
Maintenance, aircraft	272,808,154	373,113,584	437,489,238
Maintenance, installations	297,955,496	356,926,405	367,877,630
Maintenance, supplies and equipment	67,508,038	125,322,343	183,304,000
Training aids and tuition	4,948,616	6,025,060	11,325,000
Clothing and equipage	32,200,097	68,236,295	95,000,000
Research	17,447,835	24,966,100	21,561,000
Development	84,512,436	133,799,030	138,435,490
Operational engineering	10,500,000	30,000,000	12,500,000
Maintenance, reserve aircraft	18,378,045	30,125,578	29,883,256
Maintenance, reserve installations	15,457,494	27,334,160	26,433,114
ROTC	3,580,385	6,089,266	11,700,000
Air National Guard maintenance and operations	33,961,616	66,172,934	94,270,762
ANG equipment procurement	11,377,346	11,872,588	20,729,238
Totals	**$2,506,813,595**	**$2,144,964,551**	**$3,353,560,608**

Navy, BuAer

	1948 (actual)	1949 (estimated)	1950 (estimated)
Piloted aircraft	$749,093,553	$310,728,250	$662,782,500
Pilotless aircraft	6,960,728	11,223,071	13,000,000
Equipment for service schools	1,000,000	1,848,898	1,700,000
Industrial mobilization	3,558,147	6,441,853	3,900,000
Aerological instruments	574,349	574,032	710,000
Aeronautical instruments	849,758	1,600,968	2,250,000
Electronic equipment	11,150,263	17,000,000	15,940,000
Aircraft operation, regular	57,290,400	78,509,754	72,557,000
Aircraft operation, reserve	11,818,181	22,205,719	18,221,000
Aircraft overhaul, regular	105,570,189	141,917,014	142,316,081
Aircraft overhaul, reserve	17,890,204	39,803,000	40,402,525
Supporting aeronautical equipment	8,219,405	16,253,312	12,247,298
Shop equipment	5,168,915	11,592,416	7,800,000
Station operations, regular	95,550,482	104,613,245	93,405,286
Station operations, reserve	7,079,996	7,623,000	8,066,790
Research and development	75,000,000	109,681,944	79,448,262
Totals	**$1,156,774,570**	**$881,616,476**	**$1,174,746,742**

(*Continued on p.* 13)

Civil Aeronautics Administration

	1948 (actual)	1949 (estimated)	1950 (estimated)
Air navigation facilities, equipment	$7,164,318	$15,217,960	$25,137,672
Technical development, supplies and materials	98,069	165,944	149,025
Washington National Airport, supplies	139,920	203,173	222,900
W.N.A., equipment	26,906	42,419	26,100
W.N.A., construction	236,000	1,894,657	196,500
Federal-aid airport program	28,069,937	71,473,696	43,874,500
Alaska airports, construction	.....	9,812,640	2,107,360
Air navigation development projects	.....	90,000	9,943,400
Totals	**$35,735,150**	**$98,900,489**	**$81,657,457**

National Advisory Committee for Aeronautics

	1948 (actual)	1949 (estimated)	1950 (estimated)
Contractual services	$2,128,905	$2,579,000	$2,947,500
Supplies and materials	3,354,516	3,743,500	5,200,000
Equipment	4,805,221	4,420,990	5,600,000
Printing	79,987	95,000	100,000
Construction and equipment	11,370,522	20,557,000	34,722,800
Totals	**$21,739,151**	**$31,395,490**	**$48,570,300**

Procurement Focused by Munitions Board

Aircraft committee has combined separate buying plans of the military into a tight single-service program.

A powerful but little-known body within the rambling organization of the National Military Establishment—the Aircraft Committee of the Munitions Board—is credited with a major contribution toward bringing the complicated aviation procurement picture into focus as a single inter-service program, instead of two separate and independent plans.

The committee, like two other special Munitions Board committees on electronics and petroleum, received a packaged planning assignment and has been told to handle it within the limits of its prescribed functions.

► **Functional Network**—Organized as a joint military board with three Air Force officers, three Navy officers and an Army officer, the committee does its work through a full-time secretariat of officers and civilians, and through an intricate functional network of subcommittees and panels which attack a variety of industrial planning problems, all pointing toward establishment and revision of three basic integrated schedules for the aircraft industry.

Framework of the aircraft committee's inter-service integration of procurement is built on these three schedules:

• **A-Series Schedule**—Peacetime plan for handling current procurement funds, revised quarterly.

• **PA-Series Schedule**—A five-year overall planning schedule based on the basic 70-group Air Force and 14,600-plane Navy air arm concept.

• **MA-Series Schedule**—A plan for all-out, full-capacity industry mobilization.

► **Production Group**—Best picture of how the committee functions can be obtained from examination of the work of some of its individual sub-units. Probably most active of these are the three sub-units designated as the production group, which are:

• **Aircraft Scheduling Unit**—With offices at AMC headquarters, Wright-Patterson AFB, Dayton, plans schedules of materials, manpower and industrial capacity for aircraft procurement, coordinating the work of the industrial planning divisions of both Air Force and Navy Bureau of Aeronautics. This organizaton is an outgrowth of a similar interservice group which functioned effectively in World War II under the War Production Board.

• **Subcommittee on Production Programs and Industrial Planning**—A Pentagon group which divides its immediate and longer range planning work into assignments for seven panels: airframe, armament, contractual relations, guided missiles and pilotless air vehicles, propulsion, radio and radar, resources. Scope of these panels is apparent from the names, except for the contractual relations panel, a special problems group activated periodically to trouble shoot on problems such as labor disputes, management difficulties, etc.

• **Subcommittee on Preference List**—This is a new name for the old wartime priorities system for industry, still an essential part of long-range and industrial mobilization planning. Preference List is not as large nor as rigorously operated as it would be in an all-out mobilization, but it is a currently operating part of the Munitions Board's aircraft committee.

A subcommittee on supply and maintenance requirements has 12 panels including: airframe and engine accessories, airframe spares, armament, electronics, engines and engine spares, instruments, packaging and preservation, periodic maintenance practices, propellers, publications and data, technical training equipment requirements, tools and ground equipment.

► **Technical Group**—Five other subcommittees comprise the technical group. Best known of these is probably the Subcommittee on Aeronautical Standards and its related aeronautical standards group. Working with industry representatives this organization has

been responsible for effective steps toward standardizing small parts and components of military aircraft and guided missiles for the services. (A more detailed discussion of standardization appears elsewhere in this issue.)

Details of airplane design are the province of the Subcommittee on Air Force-Navy-Civil Aircraft Design Criteria, whose 13 panels deal with such basic problems as flight loading conditions, spanwise airload distribution, chordwise airload distribution, ground loads, water loads, strength of metal aircraft elements (Note: This panel recently issued a detailed manual on aircraft materials' strengths for industry and services guidance), engines, propellers, vibration and flutter, location of controls and direction of control movement, aircraft plastics, powerplant installation, sandwich construction.

▶**Aircraft Performance**—A Subcommittee on Design and Engineering has panels dealing with aircraft performance, cockpit layout, crash rescue and fire fighting, and flight test procedure.

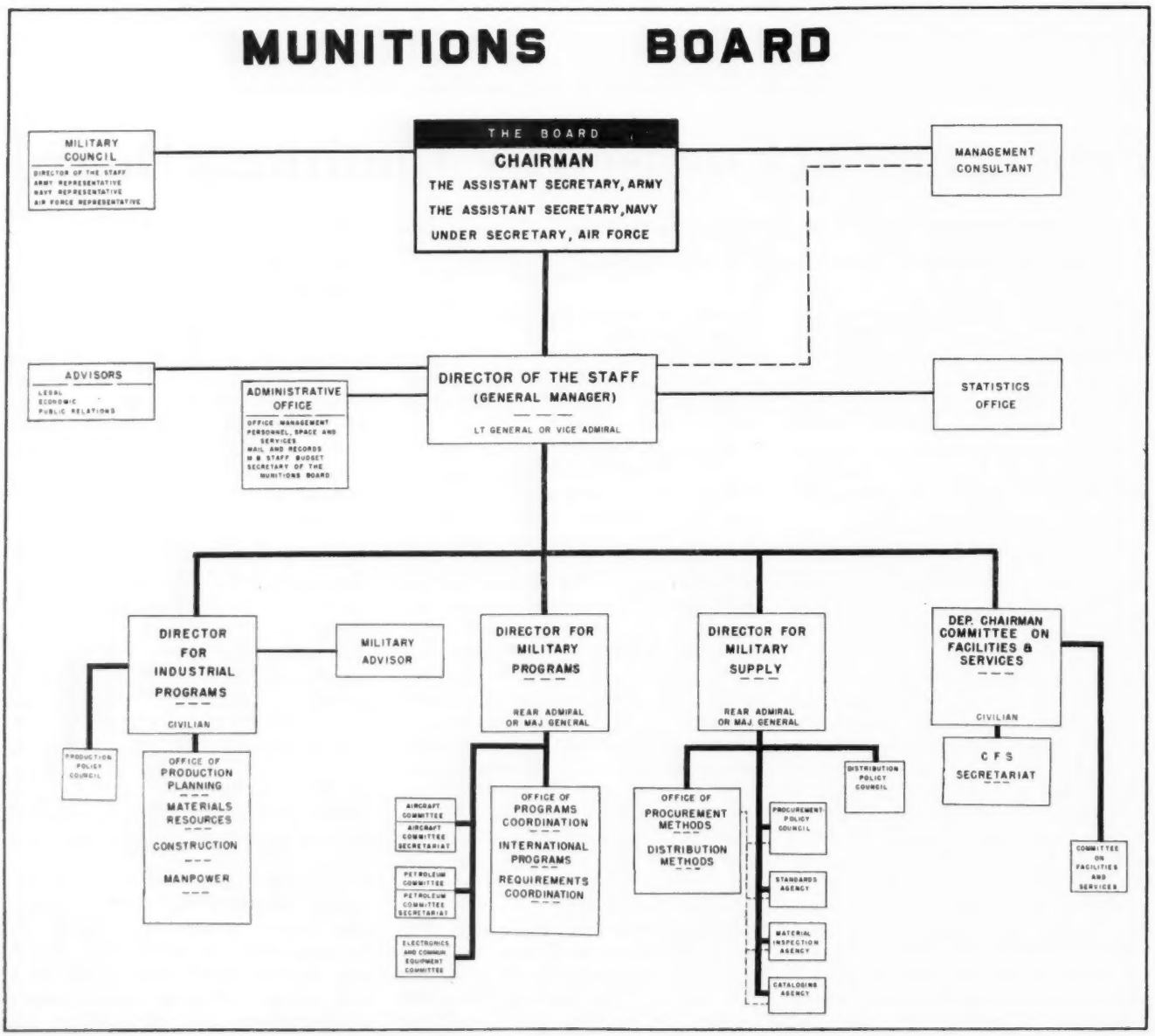
Highly specialized is the work of the Subcommittee on Visual Aids to Air Navigation, which includes panels on airport lighting evaluation, lighting and marking and an administrative panel for operating the Arcata, Calif., airport lighting experimental project.

These last three subcommittees, while dominantly composed of military representatives, have other representatives from civil aviation agencies and from the aviation industry who serve with the military members.

▶**Integrated Plan**—In studying the whole Munitions Board concept, the erroneous impression is sometimes received that the Munitions Board is an outside agency telling the military services what to do. Actually the board, its committees and sub-organizations are composed of representatives of the military departments and officers of the three services, so that they are telling themselves what to do in an integrated plan which takes into consideration requirements of the various services and capacity of the country to supply those requirements.

▶**Allocation Plan**—A Munitions Board "allocation plan" for industry is another phase of the board's work, designed to establish standby contracts which can be invoked on short notice in the event of war emergency for approximately 90 percent of American industry.

The Aircraft Committee of the Munitions Board is made up of representatives of the USAF, Navy and Army, of general or flag rank. Air force members are Maj. Gen. Francis Griswold (expected soon to be succeeded by Maj. Gen. Franklin O. Carroll), Maj. Gen. F. H. Smith, and Brig. Gen. Aaron Kessler. Navy members are Rear Adm. A. M. Pride, Rear Adm. Lloyd Harrison, and Rear Adm. Apollo Soucek. Army representative is Brig. Gen. J. K. Christmas.



Maj. Gen. O. R. Cook

Lt. Gen. K. B. Wolfe

Brig. Gen. H. A. Shepard

USAF Plans More Contracts in Fiscal 1950

Air Materiel Command has already increased number of buyers in plan aimed at simplifying its procurement.

DAYTON—Buying center of U. S. Air Force, operating under a new top echelon staff, and with a year's experience with its new buyer's system, is waiting for a "Go" signal from Congress on its 1950 fiscal year procurement.

Actually Air Materiel Command buyers are still obligating 1949 fiscal year funds, but tempo has slowed waiting for a tardy Congress to settle on the funds to be budgeted in the fiscal 1950 year.

As of June 30, 1949 AMC listed 1890 prime contractors, and 32,656 contracts requiring source inspection. This compared with 1443 prime contractors and 15,780 contracts requiring source inspection, as of July 1, 1948.

▶ **1950 Outlook**—AMC estimates for fiscal year 1950 look for the number of prime contractors to increase to 2297 and the number of contracts requiring source inspection to 39,688. (Increase in inspection requirements has already been so great as to require enlargement of the old inspection section of the procurement division, into a separate division of its own.)

The vertical buying organization of AMC, first organized in January, 1948, is shaking down into a relatively efficient organization, in the opinion of many industry representatives as well as those of its operators, although there remains room for additional improvement. Organization of buyers has increased to approximately 200 specialists, each handling a contract for one specific aircraft accessory, or piece of equipment, or in many cases several related items. (Buyers are listed elsewhere in this issue.)

▶ **Quantity Buying**—Top buyers' salaries are among the highest paid to government employes as an indication of the importance of these jobs. Yet the buyers in many cases purchase vastly greater quantities than are ordered by top industry buyers whose salaries are considerably larger.

Lt. Gen. Benjamin W. Chidlaw, recently named AMC commanding general, is assigning Maj. Gen. Orval Ray Cook as top man in the procurement organization, director of procurement and industrial planning, effective with the completion of the transfer of newly advanced Lt. Gen. K. B. Wolfe, former director, to Washington, as deputy chief of USAF staff, materiel. Brig. Gen. Horace A. Shepard, chief of Procurement Division, continues in that post.

▶ **New Plans Chief**—But a new officer is scheduled to head the industrial planning division as the changes are completed, Brig. Gen. A. H. Johnson, succeeding Maj. Gen. F. M. Hopkins, Jr. Gen. H. Hopkins becomes deputy to the commanding general for operations, and in this position will still remain close to procurement and industrial planning.

A new procedure for lining up manufacturers as sources of supply to the USAF, inaugurated this summer, is simplifying problems both of the manufacturer and the industrial planning division which handles the roster of plants deemed competent to supply materiel to the Air Force.

▶ **30,000 Sources**—Effective July 1, AMC began to issue catalogs of the various classes of items which it buys, to prospective sources. These were mailed out to approximately 30,000 manufacturers whose names were already in AMC files, as a first step in revising AMC source files.

Manufacturers were instructed to mark items in the catalogs that they would like to supply and to return the catalog to AMC. An index of additional classes of items, and their catalogs, was provided in the first mailing, together with catalogs of items in which the manufacturer had indicated previous interest. The manufacturer was invited to write for additional catalogs of other items, as shown in the index if he wanted to be considered as a source for these articles, too.

▶ **Big Response**—AMC reports that response of the manufacturers to the first mailing was far larger than had been anticipated. A mountainous return of marked catalogs is now being processed to organize the new source list. Processing is done with the aid of Remington-Rand card-sorting machines with the entire list set up on machine cards. Cards for all sources in each classification are filed together, and when AMC is ready to issue a new contract on any particular item, the machine automatically sorts the source cards to find the manufacturers who want to sell that item to the USAF.

Besides the initial mailing to current sources, the procurement division is

AMC PROCUREMENT COMMITTEE

Major Air Force contracts get final review at Air Materiel Command headquarters by the Procurement Committee, a body of veteran civilian procurement specialists which, working with the Procurement Division chiefs, backstops the buyers and their staffs on important decisions. Left to right above: Col. Phillips Smith, deputy chief, procurement division; L. A. Mincer, J. W. Schwinn, chairman, and R. W. Burns. Two other members not in photo are R. D. Lyons and F. J. Koerner.

using the new catalog and index system for convenience of other manufacturers who apply to become USAF sources, but have not previously sold to the Air Force.

▶ **First Contact**—Much of the initial contact work between AMC and a new contractor aspirant is handled through the contractors' relations office, Room 002, Building 15, Area B, Wright-Patterson AFB, at Dayton, but AMC representatives in the procurement field offices in Boston, Chicago, Dayton, Detroit, Ft. Worth, Los Angeles, New York, and San Francisco (sub-office) can answer many questions either personally or in writing, for manufacturers in their areas, without need for direct application to headquarters. (See detailed story on procurement field offices in this issue.)

The newcomer in government business dealings may object to the detail of the USAF's inquiries into his past, present and potential products, his production and research facilities, available manpower and financial responsibility. But AMC is only trying to backstop itself against letting a contract to an irresponsible or incompetent supplier, whose failure to deliver may throw a much larger procurement schedule, all keyed together, off its timetable.

▶ **Response Expected**—Once the manufacturer gets his name in the source of supply cards, he can look forward to receiving invitations to bid on supplying the products he has listed. But unless he responds he may be dropped from the list after a few invitations, because AMC is anxious to keep its source list clean of inactive bidders and that is one of the reasons for adopting the new mechanized system.

Duplicate bid invitations are posted at the contractors' relations office at AMC headquarters, and at the procurement field offices, and the contractor aspirant is invited to study these without obligation. If he sees a bid invitation for something he wants to make, he can then apply for a duplicate invitation to bid on that specific article.

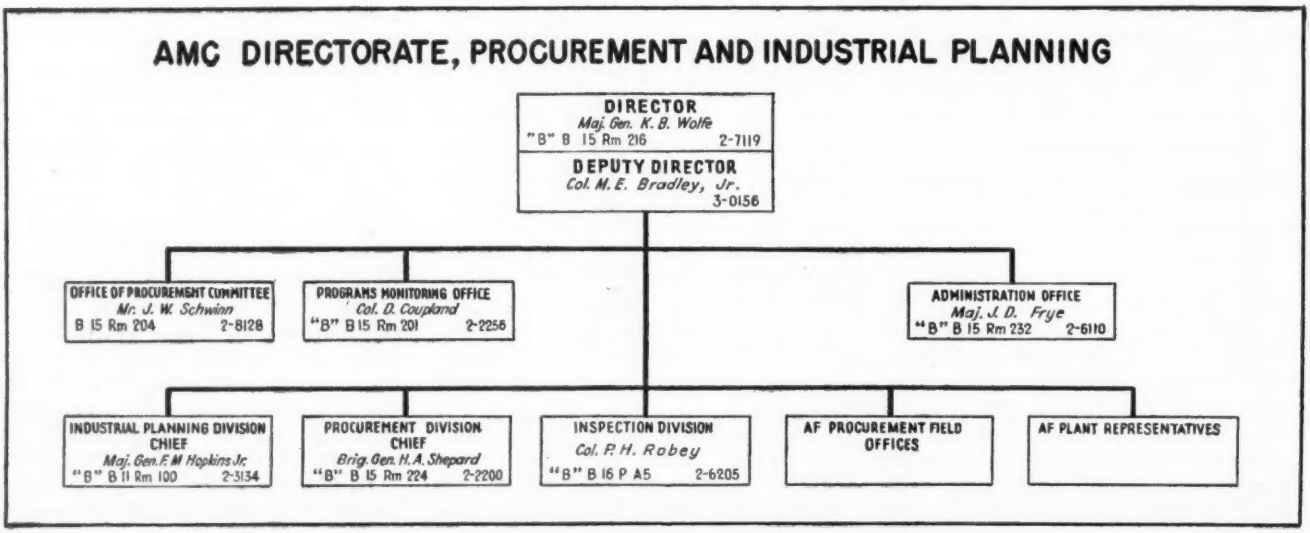
▶ **Guarantee Bond**—Air Force asks bidders to post a guarantee amounting to 20% of the aggregate price of the bid, whenever the bid is $25,000 or more. Some contractors post with AMC an annual bid bond judged sufficient to cover guarantees for contracts they expect to get. Manufacturers can obtain detailed information about bid bonds at procurement field offices or at AMC headquarters.

Most large Air Force contracts are negotiated, between USAF and companies which can meet the bid requirements. But these are only a small fraction numerically in the total USAF contract picture. The others, advertised contracts, are the ones designed mainly for small business and for concerns not prepared to do extensive research on elaborate projects. Negotiated contracts have to be authorized by the office of the Undersecretary of the Air Force.

▶ **Pre-Check**—Before a contract is advertised, or negotiated, it goes through an elaborate system of checking. Initiated as a purchase request by one of the Air Force commands, it is checked by the following AMC divisions:

- **Supply division** checks spare parts and tool requirements.
- **Budget and Fiscal division** determines availability of funds.
- **Industrial Planning division** requirements branch checks materials required.
- **Engineering division** approves drawings and specifications.
- **Office of Judge Advocate** approves license rights and patents clauses.

Buyers of aircraft, missiles, aero equipment and materiel, perform a function similar to commercial buyers, but AMC's research buyers deal in less tangible commodities. They are making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- **POWER PLANT BRANCH** — *Lt. Col. H. M. Keeffe* — B 11A Rm 286 2-3109

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exploratory purchases seeking advanced knowledge which will lead to later purchases of practical military equipment. (Materiel buying includes off-the-shelf items such as paints, tools, photographic supplies, etc.

▶ **Specialist Team**—In handling a contract, the buyer has available a team of specialists on legal and price analysis aspects who can be called in and he may also call AMC engineering specialists if he needs them.

Before final approval, contracts are reviewed by a five-man procurement committee at AMC. It is a seasoned team of civilian procurement experts, responsible only to the top director. The committee automatically reviews every contract of $100,000 or more, and may look at any smaller contract if it wishes.

In fiscal 1949, the committee reviewed approximately 2500 contracts. Contracts of $100,000 to $1 million must be approved by the Procurement Division chief (Gen. Shepard). Contracts of $1 million and more must be approved by the director of Procurement and Industrial Mobilization. (Gen. Cook when he succeeds Gen. Wolfe.)

▶ **After Signing**—After the buyer completes the contract he continues to follow it throughout its life. He makes subsequent decision as to allowable deviations from specifications and contract changes. He follows up through inspection from the field office, on how production schedules are met. He decides when government may exercise its rights under the latent defect contract clause, and finally he is expected to handle termination proceedings.

A continuing training program for buyers, with periodic lectures and study on various phases of procurement, is credited by Gen. Shepard with improvement in buying techniques this year.

The Procurement Committee has prepared interpretations and policies for the buyers' guidance. Another method of training used, permits different buyers to sit in with the committee at contract reviews, participating in discussions and consideration of individual contract problems.

▶ **Basic Agreements**—A new system of basic agreements with contractors who are regular USAF suppliers is another important shortcut which AMC is preparing (AVIATION WEEK, Aug. 29).

Briefly, a basic agreement is a contract whose clauses are made applicable to all other contracts between the manufacturer and the Air Force for a specified period. It eliminates many standard clauses in the other contracts, saving time and money for both parties.

▶ **Progress Report**—Other steps toward simplifying and implementing procurement procedure in the past year cited by AMC include:

- Enlarging buyer's authority to make it optional instead of mandatory that he consult with activities outside his own office on matters of price and fiscal clearance.
- Establishment of simplified contract forms for smaller procurements.
- Expediting coordination and approval from the Deputy Chief of Staff, Materiel.
- Shortening flow time required for the Under Secretary to pass on certain contracts. (This was done by the Under Secretary himself in the closing weeks of fiscal 1949, when he established his desk at AMC headquarters and made himself available for quick action on these contracts.)
- Clauses were inserted in prime contracts obligating the prime contractor to seek to place sub-contracts with small plants.

WELCOME MAT FOR CONTRACTORS

Manufacturers who are or who seek to become USAF contractors find a welcome in a well-equipped reception center at Wright-Patterson AFB, Dayton, Ohio, operated by the contractors' relations branch. Photo shows one section of the pine-paneled room where bid invitations and contract award abstracts are posted. At left an index system helps contractors and their representatives find bid invitations for their products.

Inquiry Service

AVIATION WEEK will answer any queries about government procurement programs described in this issue, or will refer your questions to the proper government agency charged with supplying the information requested. Send specific inquiries to Procurement Editor, AVIATION WEEK, 1174 National Press Bldg., Washington 4, D. C.

Aluminum Pile

Munitions Board may take aluminum from its list of material not recommended for purchase but kept under study, making the metal available to be purchased for stockpiling.

Aluminum industry spokesmen say the board can acquire 150 million lb. of the metal for the government stockpile in fiscal 1950 without adverse effect to the domestic economy.

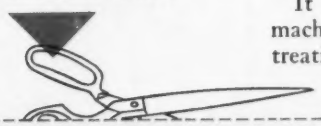
Amount available for stockpiling would include 60 million lb. already agreed to by the General Services Administration. Of this amount, 24 million lb. would come from Reynolds Metal Co. in lieu of rent on a government-owned plant which it leases, and 36 million lb. from Permanente Metals Corp. in part payment for a government-owned plant it has purchased.

New Contract Form

General Services Administrator Jess Larson has revised the government procurement contract form into a common style which will be used by contractors in both competitive and negotiated bid dealings.

New form will apply to all government agencies, civil and military. It carries a clause which the contractor must sign, stating that no agent has been secured for a commission or percentage fee to help secure the contract. However, it does make provision for bona fide employes, commercial agencies and representatives who are maintained by the contractor for the purpose of securing business.

A handy guide to Alloy Steels for aircraft applications



Here for ready reference are listed the various grades of U·S·S Carilloy constructional alloy steels available for use in airframe and aircraft parts.

The grades shown for each application or part are not necessarily the only grades suited for a particular purpose, but are rather those grades most commonly used prior to 1941, together with some of the new alloy steels developed during the war.

It is obvious that design, economy, machining facilities, availability of heat treating equipment, and other factors will enter into your final selection of the alloy grade for your particular purpose. To get optimum results from these steels, we suggest that you obtain expert advice both in selecting and applying them. This we are prepared to furnish.

Our staff of service metallurgists is always ready to study individual problems and to assist you with practical recommendations that you will find extremely helpful not only in determining what grade of U·S·S Carilloy will do the best job for you, but also in showing how it can be handled efficiently in your shop.

	SHEET OR TUBING, LANDING GEAR, ENGINE FRAMES	CYLINDER BARRELS		CRANK SHAFTS, PROPELLER SHAFTS AND OTHER SHAFTING		PROPELLER HUBS	MASTER AND ARTICULATING RODS	PISTON PINS	CRANK CASES	LANDING GEAR FORGINGS	SHEETS, PLATES	PUMP SHAFTS AND PINS, BUSHINGS, THRUST PLATES	GEARS	
Tensile Strength Range, psi.	75,000 to 175,000	125,000 to 160,000	140,000 to 170,000	140,000 to 170,000	150,000 to 200,000	140,000 to 190,000	140,000 to 200,000	150,000 to 200,000	140,000 to 170,000	150,000 to 200,000	100,000 to 175,000	140,000 to 170,000	125,000 to 200,000	150,000 to 240,000
Heat Treatment ——→	Quenched and Tempered, or Cold Finished With or Without Heat Treatment	Oil Quenched and Tempered	Quenched, Tempered and Nitrided	Carburized and Quenched and Tempered	Oil Quenched and Tempered	Oil Quenched and Tempered	Oil Quenched and Tempered	Oil Quenched and Tempered	Oil Quenched and Tempered	Oil Quenched and Tempered	Normalized or Quenched and Tempered	Quenched, Tempered and Nitrided	Carburized Quenched and Tempered or Quenched, Tempered and Nitrided	Carburized Quenched and Tempered or Quenched, Tempered and Nitrided
TYPES Ni				2515 2517 AMS 6242									2512 2517 AMS 6240 AMS 6242	2517 AMS 6242
Ni Cr					3140 AMS 6332		3140 AMS 6332							
				3310 AMS 6250				3310 AMS 6250						3310- 3316 SuperKore A AMS 6250 AMS 6253 AMS 6266
Cr Mo	4130 4135 4137 AMS 6361 AMS 6362 AMS 6363 AMS 6365 AMS 6366 AMS 6367 AMS 6368 AMS 6369 AMS 6352	4140 AMS 6382							4140 AMS 6382	4130 4137 AMS 6370 AMS 6380	4130 AMS 6350			
Ni Cr Mo	4337 AMS 6359				4337 4340 AMS 6412 AMS 6415	4337 4340 AMS 6412 AMS 6415	4337 AMS 6412			4337 4340 AMS 6412 AMS 6415				
Ni Mo								4640 AMS 6312					4620 AMS 6294	
Cr V						6150 AMS 6448		6150 AMS 6448						
Ni Cr Mo	8630 AMS 6355										8630 AMS 6355		8615 8617 8620 AMS 6270 AMS 6272 AMS 6274	
	8735 AMS 6357	8740 AMS 6322							8740 AMS 6322 AMS 6324	8740 AMS 6322 AMS 6324				
				9310 AMS 6260				9310 AMS 6260	9840 AMS 6342	9840 AMS 6342				9310 9315 SuperKore A AMS 6260 AMS 6263 AMS 6266
Cr Mo Al			AMS 6470									AMS 6470		AMS 6470

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Procurement Tips to Manufacturers

Do . . .

• Register your plant facilities with both the Air Force and the Navy, using new AMC cataloging system and Navy industrial planning program.

• Visit regularly your nearest regional Air Force procurement field office, and Navy district representative office for late procurement information.

• Assign one key executive in your plant to become a specialist on military procurement.

• Investigate annual bid bond procedure to save time and money if you expect to become a regular bidder on Air Force and Navy contracts.

• Get your company and its products listed with local Air Force and Navy installations in the contracting officer or commanding officer's local procurement source list, if you want small local procurement contracts. Separate listings are required at each installation.

• Let the big Air Force and Navy prime contractors in your area know about your facilities and interest in supplying the armed services. Subcontracting more and more is becoming an important part of total procurement, and prime contractors are looking for additional component manufacturers.

• Find out from your postmaster whether your plant is located in one of the "distressed employment" areas. If it is, your plant has a special advantage in obtaining military procurement contracts.

• Require a thorough study of your bid from a legal standpoint, reading and re-reading the fine print and specifications, and particularly looking at patent clauses, before you submit it.

• Make a careful engineering recheck of your cost estimate to be sure you have included every specification required in the bid invitation. You can't back out without penalty once the bid is submitted.

• Consult at Wright Field or Washington with Air Force or Navy engineers who know the product, if you want to bid on a product you have never made before. If in doubt, submit samples.

• Examine the services' buying on non-aircraft standard items. They are in the market for large quantities of standard hardware, machine tools, housekeeping equipment and many other non-aircraft products.

• Know something about the latest trends in research and development in military aviation and related fields as a guide to production orders of future years.

• Follow the practice of making a written record on your dealings with the government. Confirm your verbal arrangements with the government in writing and get written confirmation of government verbal agreements with you.

• Investigate the possibility of sharing a Dayton or Washington representative with other non-competing manufacturers. A competent, trustworthy representative can save valuable time in follow-ups at either place, if your anticipated volume is large enough to warrant his part-time employment.

• Find out about licensor-licensee programs which are part of the industrial mobilization joint plan of USAF and Navy. Perhaps your plant might fit into this picture also.

Don't . . .

• Be afraid to go to the top officials for red tape relief if necessary. Defense Secretary Johnson has pledged a national military establishment policy to investigate any "brushoff" and "run-around" tactics against small business.

(Procurement Tips continued on page 22)

Procurement Tips to Manufacturers

(Continued from page 21)

Don't . . .

• Expect contract relations with the government through either prime or subcontract to be as simple as those with another individual or firm. There are always extra checks and balances in government dealings which experience has indicated are necessary.

• Expect the services to set you up as a manufacturer on the basis of your inventions or ideas. Research and development contracts are let for ideas and inventions, but the services want a manufacturer who has productive capacity and know-how promptly available for its production contracts.

• Ask for any special favors from contracting officials. They and you are inviting serious trouble if you get unwarranted preferred treatment over your competitors, who are almost sure to find out and squawk loud and clear in the right places.

• Wait for the news of your plant's approval as a source of supply to filter down to the prime contractors in your area. As soon as you get approval get the word around quick to any big plants in your area which might have subcontracts to let.

• Be discouraged when you don't get a contract immediately as a result of your first visit to the Air Force or Navy. No contracts are let until after manufacturers comply with preliminary requirements and submit to a thorough check on plant facilities, financial status, loyalty, etc.

• Gripe unnecessarily to the working level procurement officials about the red tap restrictions. Chances are they are more familiar than you with the difficulties caused by over complication of regulation, and would have done something about it already, if they could.

• Think procurement officers are going to take the shortcuts in peacetime that they sometimes have to take in war emergency. Experience has shown that when the longer regular procedures are followed it usually protects both parties better and saves the taxpayer money.

• Let your contract negotiation lie overlong in a basket on somebody's desk. If it seems to be at an unnecessary standstill, follow up at the place where it was last heard from, and ask for a progress report to get it moving again.

• Be a wide-eyed innocent in your government contract dealings, but don't get unnecessarily hard-boiled. The Air Force and the Navy are not out to swindle you but they expect you to protect your own interests as in any business transaction.

• Get yourself mixed up in any shady, "under-the-table" transactions. The FBI, the General Accounting Office, and Congressional investigations can do irreparable damage overnight to a previously reputable firm that makes a false step.

• Wear a path between your plant and Washington and Wright Field. Plan your trips to these spots so you can limit their number and expense, and take full advantage of the services of the field offices of both Air Force and Navy.

• Worry too seriously about government recapture of legitimate profits through renegotiation. Aim of the 1948 Renegotiation Act is to curtail excessive profits but both services know that private industry is entitled to a fair profit, and the Secretary of National Defense has authority to exempt contractors where provisions of the act are onerous or complicate unnecessarily the transaction involved.

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How Naval Air Procurement Works

Bureau of Aeronautics in Washington handles purchases of airplanes, sets standard for other Navy buying.

Naval Aviation's procurement program for fiscal 1950 centers primarily at the Bureau of Aeronautics in Washington, and will be directed by the three-pronged efforts of BuAer's research development, design and engineering, and material and services, divisions.

BuAer's fiscal 1950 budget totals $1,618,667,000, and includes $576,546,000 in contract authorizations.

Navy plans to buy 608 fighters, 134 attack planes, 51 patrol bombers, 5 transports, 35 helicopters and 10 trainers.

This year's procurement will accent Naval Aviation's emphasis on jet-powered planes, with an estimated 68 percent of its fiscal 1950 buying set aside for jet aircraft.

► **R and D Cut**—Research and development fund cuts will force BuAer to abandon its development of five advanced aircraft prototypes and delay development of four others.

Navy has more than once voiced the sentiment that its aviation budget is too low, and will force a cutback in airplanes from 14,918 early this year to 12,888 by Feb. 1, 1950. All this means that BuAer will try to drive a harder bargain in the contracts which it will negotiate with industry during the coming year.

► **Setup**—The three divisions handling Naval Aviation procurement function in this way:

• **Research and Development:** This division headed by Rear Admiral C. M. Bolster, is in charge of all experimental programs. R and D contracts fall into two groups—research contracts (those with no end product in sight); and development contracts (those which call for eventual production of an end product).

• **Design and Engineering:** On development contracts, this division, under Rear Admiral Lloyd Harrison, forms the program of specific items required for large scale production. Each item, such as armament, electronic equipment, powerplant, and airborne equipment is allocated to a "desk" which devises individual requirements.

• **Materiel and Services:** When the requirements are decided, they pass through the Chief of Naval Operations to this Division, under Rear Admiral W. J. Johnson, which sets up the actual procurement program in the form of directives. It is this procurement directive that eventually becomes a contract.

Bureau of Aeronautics, at Navy headquarters in Washington, does all the

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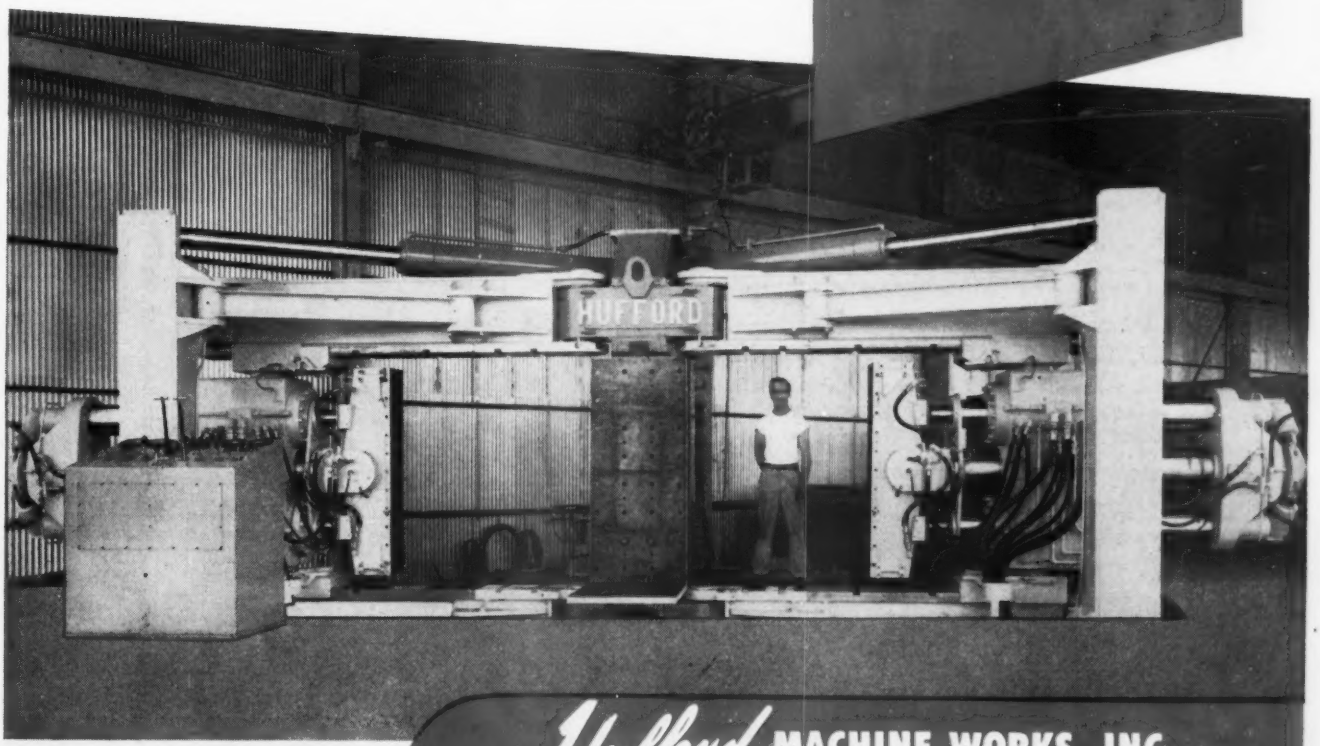

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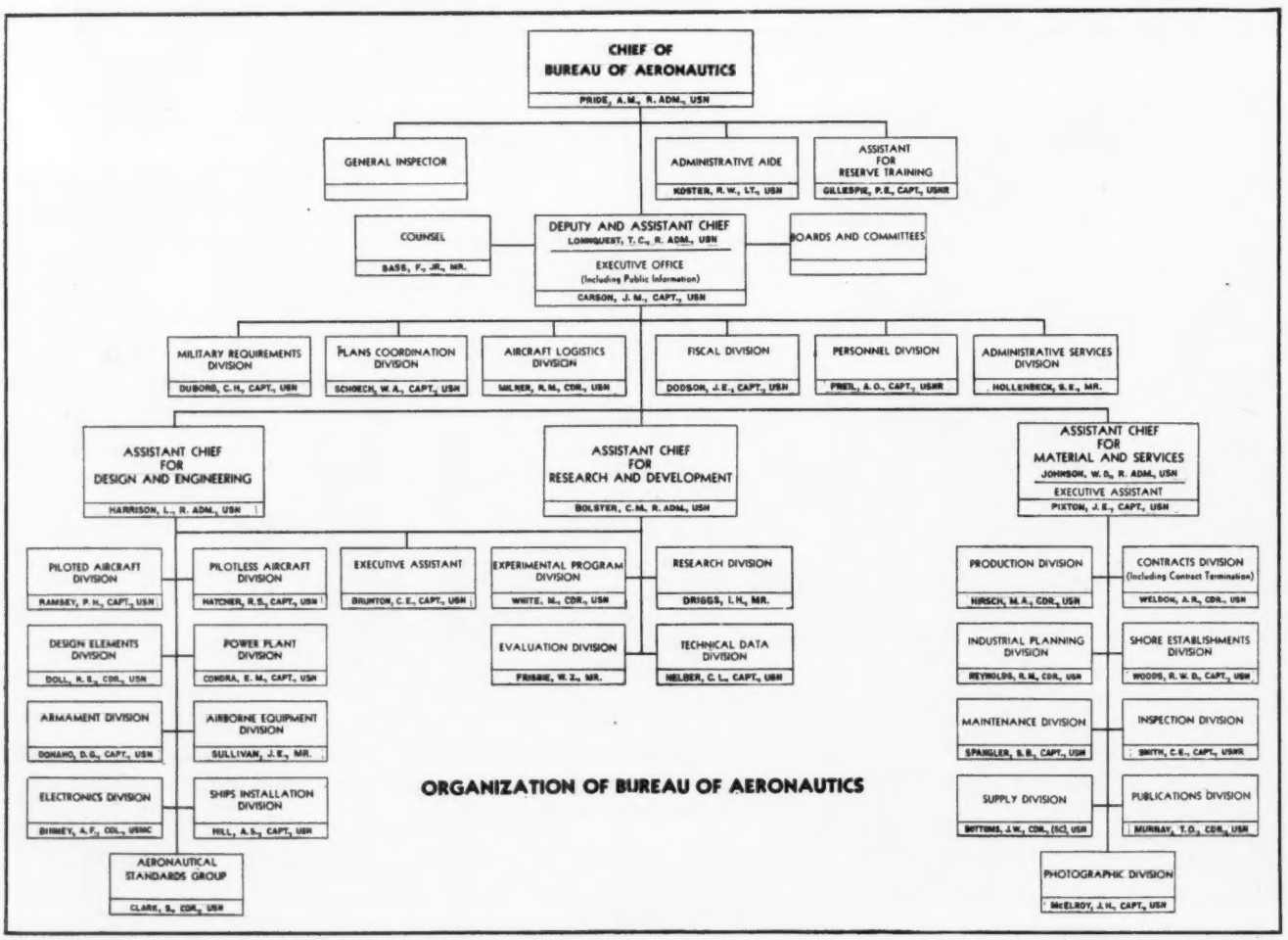
buying of Naval Aviation's planes, powerplants and instruments, including spares and maintenance equipment for the instruments. This means that most of its buying is done through negotiated contracts.

Here's why: BuAer's procurement of such items as airframes, engines and propellers is usually based on recommendations of its specialist officers, who indicate such full requirements that the list of vendors who can comply is considerably narrowed. Through the years, airframe manufacturers have specialized in certain types of craft, such as fighters, bombers, attack planes and transport aircraft. When BuAer opens a competition for a new aircraft, therefore, it solicits bids from those manufacturers with which it has had previous dealing in buying that particular type.

► **Incentive Plan**—Navy's airframe contracts are all handled under an incentive plan, which works this way: BuAer and the manufacturer agree on the best negotiable price, which includes a standard rate of profit. If the manufacturer finds it costs more to build his plane than the original price, the difference is split between the Navy and the contractor.

But if the planes are built at less than the original specified cost, the manufacturer is allowed 20 percent of the difference as added profit. Navy, of course, benefits from the other 80 percent.

Last year at this time, Naval Aviation, through a program outlined by the Secretary of Navy, Chief of Naval Operations, and the Joint Chiefs of Staff, was planning an expansion program with a target of 14,500 planes by the middle of this year. To do this, according to the plan, 3600 planes were taken out of storage pools. These included Curtiss Helldivers, Grumman Avengers, Vought Corsairs and Grumman Hellcats. Now the storage pool is almost completely depleted and replacement of these craft will be one of the


CHIEF OF BUREAU OF AERONAUTICS
PRIDE, A. M., R. ADM., USN
GENERAL INSPECTOR
ADMINISTRATIVE AIDE
KOSTER, R. W., LT., USN
ASSISTANT FOR RESERVE TRAINING
GILLESPIE, P. E., CAPT., USNR
COUNSEL
BASS, F., JR., MR.
DEPUTY AND ASSISTANT CHIEF
LONNQUEST, T. C., R. ADM., USN
EXECUTIVE OFFICE (Including Public Information)
CARSON, J. M., CAPT., USN
BOARDS AND COMMITTEES
MILITARY REQUIREMENTS DIVISION
DUBORD, C. H., CAPT., USN
PLANS COORDINATION DIVISION
SCHOECH, W. A., CAPT., USN
AIRCRAFT LOGISTICS DIVISION
MILNER, R. M., CDR., USN
FISCAL DIVISION
DODSON, J. E., CAPT., USN
PERSONNEL DIVISION
PRETL, A. O., CAPT., USNR
ADMINISTRATIVE SERVICES DIVISION
HOLLENBECK, G. E., MR.
ASSISTANT CHIEF FOR DESIGN AND ENGINEERING
HARRISON, L., R. ADM., USN
ASSISTANT CHIEF FOR RESEARCH AND DEVELOPMENT
BOLSTER, C. M., R. ADM., USN
ASSISTANT CHIEF FOR MATERIAL AND SERVICES
JOHNSON, W. D., R. ADM., USN
EXECUTIVE ASSISTANT
PIXTON, J. E., CAPT., USN
PILOTED AIRCRAFT DIVISION
RAMSEY, P. H., CAPT., USN
PILOTLESS AIRCRAFT DIVISION
HATCHER, R. S., CAPT., USN
EXECUTIVE ASSISTANT
BRUNTON, C. E., CAPT., USN
EXPERIMENTAL PROGRAM DIVISION
WHITE, M., CDR., USN
RESEARCH DIVISION
DRIGGS, I. H., MR.
DESIGN ELEMENTS DIVISION
DOLL, R. S., CDR., USN
POWER PLANT DIVISION
CONDRA, E. M., CAPT., USN
EVALUATION DIVISION
FRISBIE, W. Z., MR.
TECHNICAL DATA DIVISION
NELBER, C. L., CAPT., USN
ARMAMENT DIVISION
DONAHO, D. G., CAPT., USN
AIRBORNE EQUIPMENT DIVISION
SULLIVAN, J. E., MR.
ELECTRONICS DIVISION
BURNEY, A. F., COL., USMC
SHIPS INSTALLATION DIVISION
HILL, A. S., CAPT., USN
AERONAUTICAL STANDARDS GROUP
CLARK, S., CDR., USN
PRODUCTION DIVISION
HIRSCH, M. A., CDR., USN
CONTRACTS DIVISION (Including Contract Termination)
WELDON, A. R., CDR., USN
INDUSTRIAL PLANNING DIVISION
REYNOLDS, R. M., CDR., USN
SHORE ESTABLISHMENTS DIVISION
WOODS, R. W. D., CAPT., USN
MAINTENANCE DIVISION
SPANGLER, S. B., CAPT., USN
INSPECTION DIVISION
SMITH, C. E., CAPT., USNR
SUPPLY DIVISION
BOTTOMS, J. W., CDR., (SC), USN
PUBLICATIONS DIVISION
MURRAY, T. O., CDR., USN
PHOTOGRAPHIC DIVISION
McELROY, J. H., CAPT., USN

ORGANIZATION OF BUREAU OF AERONAUTICS

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Wiggins finger tip installation and service of all air — oxygen — or liquid lines.
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Applicable AN specifications are met or exceeded.
Initial cost slightly higher than screw-on fittings — *But — time saved the first time used more than pays for the Inst-O-Matics.*

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Air Associates engineer salesmen are ready to discuss special installation requirements.

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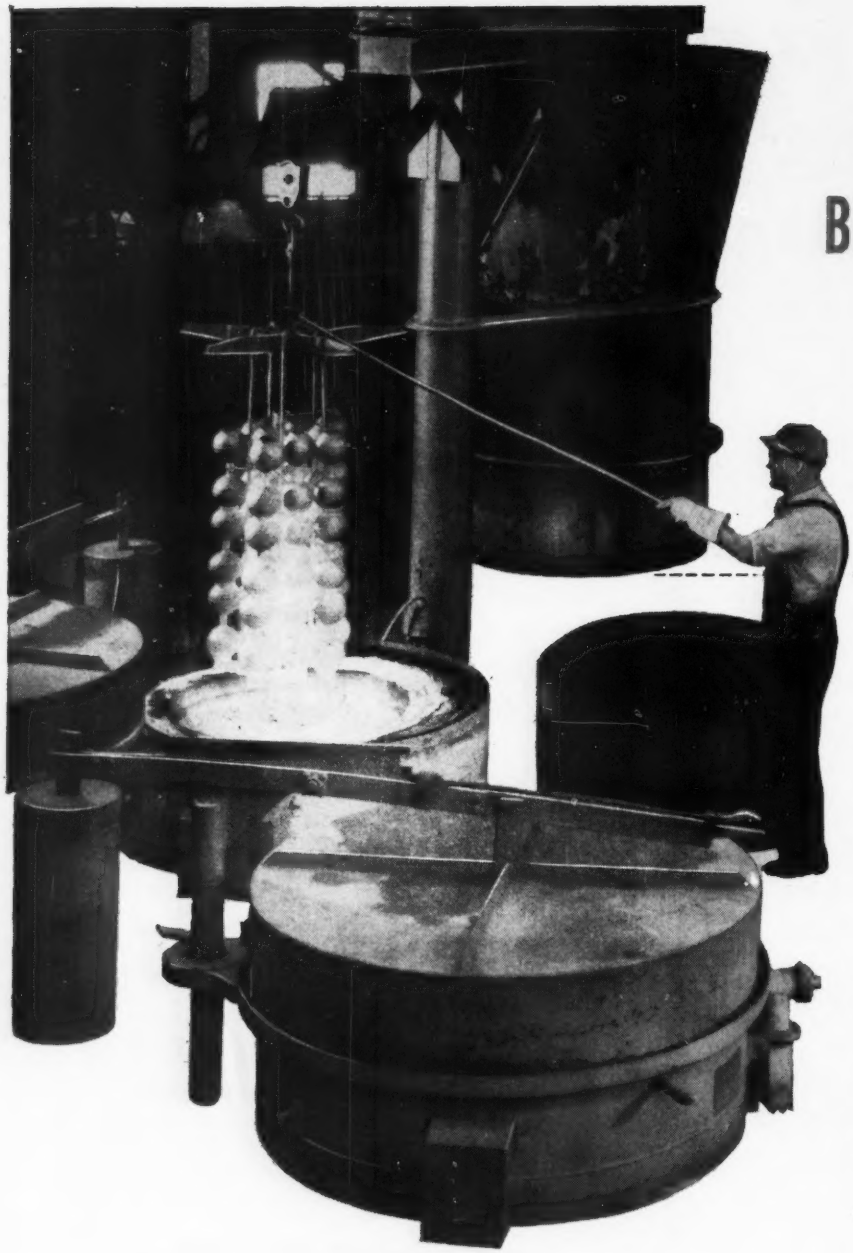
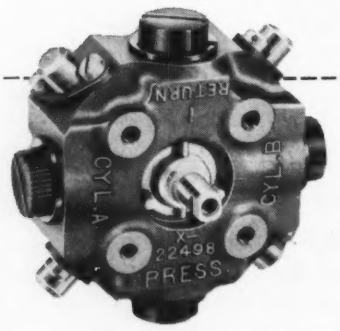


Processing BETTER RESOURCES MEAN BETTER PRODUCTS

As a vital phase of its complete resources, Bendix-Pacific has developed through years of experience, what industry has accepted to be the most satisfactory processing methods in the manufacturing of its hydraulic and electro-mechanical products.

Under its own roof Bendix-Pacific is fully equipped for heat treating, plating, anodizing, brazing, flash welding, induction hardening, atomic hydrogen welding and other advanced controlled atmospheric welding processes which contribute to the performance and high quality of every Bendix-Pacific product. All necessary processes and operators are certified by the Army Air Forces.



The Bendix-Pacific 4-way directional control valves are among these products. Light weight, long life and simple, rugged construction characterize these valves. They are available with pilot, motor, solenoid and manual control for 1500 PSI and 3000 PSI systems. Our engineers are available for consultation and assistance on installations.

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MEAN BETTER
PRODUCTS

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Bendix Aviation Corporation
NORTH HOLLYWOOD, CALIF.

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big factors in Navy's 1950 air program.

► **Plane Types**—Naval Aviation's fighter contracts this year will be split between Grumman's Panther (F9F) and Chance Vought's Cutlass (F7U). Douglas' Skyraider series will probably form the bulk of Navy's attack planes, along with North American AJ-1s and the Grumman AF series. Patrol planes will be latest version of the Lockheed Neptune (P2V-4) series and Convair P5Y flying boats. Bulk of the copters will be Piasecki HRP-1s with some HRP-2 all-metal transport types.

This year the trend is toward heavier and more expensive aircraft, with an average weight of 9150 lb. Average cost to Navy for a jet aircraft is $829,517, compared to $694,934 for a piston-powered plane.

Joint Purchases

Economies through joint AF-Navy purchasing of many items of military aviation equipment are being speeded by action of the new Department of Defense Management Committee, headed by Gen. Joseph T. McNarney, former Air Materiel Command head.

The armed services are already pooling their requirements for common items to the extent of 89 percent of their total buying with prospects doubtful that much more joint purchasing can be done on the remaining 11 percent, mostly single-service equipment.

While purchases of aircraft engines, propellers and airframes are divided between the Air Force and Navy because of special requirements of the two services, a system of cognizance has been worked out between the services to eliminate duplication.

Fuel and oil requirements of all three services are purchased through the Armed Services Petroleum Purchasing Agency, in Room 11005, Temporary Bldg. 4, Washington 25.

Air Force (Procurement Division, Wright-Patterson AFB, Dayton) is charged with purchasing all photographic equipment except medical X-ray film, for all the services.

Medical supplies for all three services are bought by the Armed Services Medical Procurement Agency, 84 Sands St., Brooklyn 1, N. Y.

Navy Purchasing Office, 18th and Constitution Ave., Washington 25, has been designated to purchase hand tools, edge tools such as saws, mechanics' measuring tools and similar items for all three services.

Complete details as to procurement assignments amongs the services are listed in Index of Military Purchasing Offices which has been prepared by the Munitions Board. Copies may be obtained from that agency at Washington 25, D. C.

Did you know that SHIMS can be MADE ADJUSTABLE?

...to cut machining costs
...to save assembly time

Laminated shims, stamped from sheets of ***LAMINUM****, are **adjustable.** Laminations of .002 or .003 inch brass or steel simply p-e-e-l off with a penknife, right at the job!

HERE ARE THE ADVANTAGES:

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Send today for our new data file with specifications, design factors and applications. Sample of ***LAMINUM*** included.

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Press capacity to 100 tons, 24 inches square, shallow draw. Special equipment and variety of dies can eliminate die-making for short runs. Wide stock of materials. Let us quote on your *difficult* jobs.

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THE SOLID SHIM THAT peels FOR ADJUSTMENT

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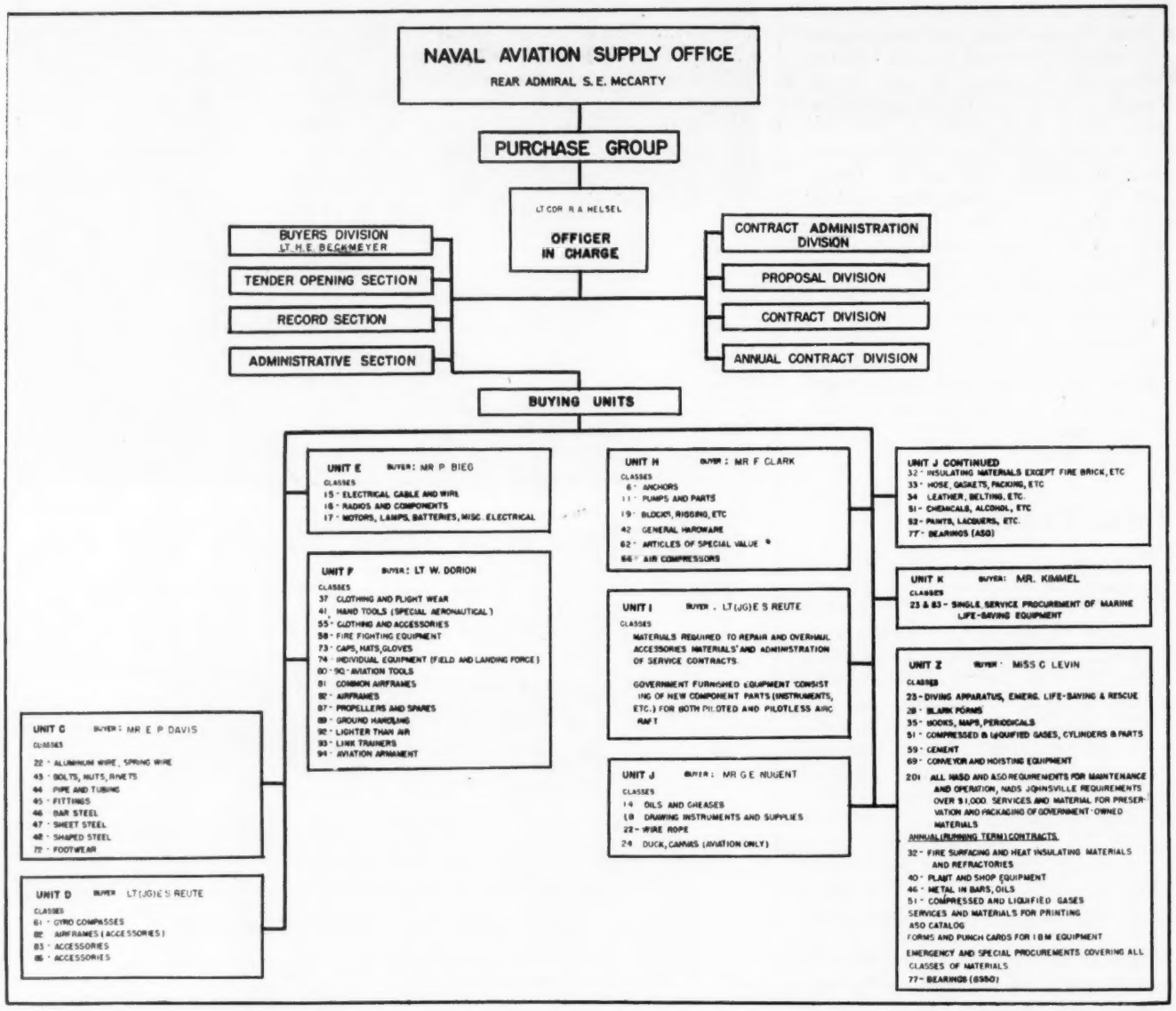
SHIMS SHIM STOCK STAMPINGS AN-COR-LOX NUTS


NAVAL AVIATION SUPPLY OFFICE
REAR ADMIRAL S.E. McCARTY
PURCHASE GROUP
LT COR R A HELSEL
OFFICER IN CHARGE
BUYERS DIVISION
LT H.E. BECKMEYER
TENDER OPENING SECTION
RECORD SECTION
ADMINISTRATIVE SECTION
CONTRACT ADMINISTRATION DIVISION
PROPOSAL DIVISION
CONTRACT DIVISION
ANNUAL CONTRACT DIVISION
BUYING UNITS
UNIT E BUYER: MR P BIEG
CLASSES
15 - ELECTRICAL CABLE AND WIRE
16 - RADIOS AND COMPONENTS
17 - MOTORS, LAMPS, BATTERIES, MISC. ELECTRICAL
UNIT F BUYER: LT W. DORION
CLASSES
37 CLOTHING AND FLIGHT WEAR
41 HAND TOOLS (SPECIAL AERONAUTICAL)
55 - CLOTHING AND ACCESSORIES
58 - FIRE FIGHTING EQUIPMENT
73 - CAPS, HATS, GLOVES
74 - INDIVIDUAL EQUIPMENT (FIELD AND LANDING FORCE)
80 - 90 - AVIATION TOOLS
91 COMMON AIRFRAMES
92 - AIRFRAMES
97 - PROPELLERS AND SPARES
99 - GROUND HANDLING
92 - LIGHTER THAN AIR
93 - LINK TRAINERS
94 - AVIATION ARMAMENT
UNIT G BUYER: MR E P DAVIS
CLASSES
22 - ALUMINUM WIRE, SPRING WIRE
43 - BOLTS, NUTS, RIVETS
44 - PIPE AND TUBING
45 - FITTINGS
46 - BAR STEEL
47 - SHEET STEEL
48 - SHAPED STEEL
72 - FOOTWEAR
UNIT D BUYER LT (JG) E S REUTE
CLASSES
61 - GYRO COMPASSES
82 AIRFRAMES (ACCESSORIES)
83 - ACCESSORIES
85 - ACCESSORIES
UNIT H BUYER: MR F CLARK
CLASSES
6 - ANCHORS
11 - PUMPS AND PARTS
19 - BLOCKS, RIGGING, ETC
42 GENERAL HARDWARE
62 - ARTICLES OF SPECIAL VALUE
66 - AIR COMPRESSORS
UNIT I BUYER . LT (JG) E S REUTE
CLASSES
MATERIALS REQUIRED TO REPAIR AND OVERHAUL ACCESSORIES MATERIALS AND ADMINISTRATION OF SERVICE CONTRACTS.
GOVERNMENT FURNISHED EQUIPMENT CONSISTING OF NEW COMPONENT PARTS (INSTRUMENTS, ETC.) FOR BOTH PILOTED AND PILOTLESS AIRCRAFT
UNIT J BUYER: MR G E NUGENT
CLASSES
14 OILS AND GREASES
18 DRAWING INSTRUMENTS AND SUPPLIES
22 - WIRE ROPE
24 DUCK, CANVAS (AVIATION ONLY)
UNIT J CONTINUED
32 - INSULATING MATERIALS EXCEPT FIRE BRICK, ETC
33 - HOSE, GASKETS, PACKING, ETC
34 LEATHER, BELTING, ETC.
51 - CHEMICALS, ALCOHOL, ETC
52 - PAINTS, LACQUERS, ETC.
77 - BEARINGS (ASO)
UNIT K BUYER: MR. KIMMEL
CLASSES
23 & 83 - SINGLE SERVICE PROCUREMENT OF MARINE LIFE-SAVING EQUIPMENT
UNIT Z BUYER: MISS C LEVIN
CLASSES
23 - DIVING APPARATUS, EMERG. LIFE-SAVING & RESCUE
28 - BLANK FORMS
35 - BOOKS, MAPS, PERIODICALS
51 - COMPRESSED & LIQUIFIED GASES, CYLINDERS & PARTS
59 - CEMENT
69 - CONVEYOR AND HOISTING EQUIPMENT
201 ALL NASO AND ASO REQUIREMENTS FOR MAINTENANCE AND OPERATION, NADS JOHNSVILLE REQUIREMENTS OVER $1,000 SERVICES AND MATERIAL FOR PRESERVATION AND PACKAGING OF GOVERNMENT OWNED MATERIALS
ANNUAL (RUNNING TERM) CONTRACTS.
32 - FIRE SURFACING AND HEAT INSULATING MATERIALS AND REFRACTORIES
40 - PLANT AND SHOP EQUIPMENT
46 - METAL IN BARS, OILS
51 - COMPRESSED AND LIQUIFIED GASES
SERVICES AND MATERIALS FOR PRINTING
ASO CATALOG
FORMS AND PUNCH CARDS FOR IBM EQUIPMENT
EMERGENCY AND SPECIAL PROCUREMENTS COVERING ALL CLASSES OF MATERIALS
77 - BEARINGS (6950)

NASO—$½ Billion Market

Huge Philadelphia installation buys spares, hardware, accessories and raw materials for Naval aviation.

PHILADELPHIA—Navy's procurement of aviation material, with the exception of airframes, engines and propellers, is handled at the sprawling Naval Aviation Supply Office at Oxford avenue and Martin's Mill road, in Philadelphia.

Here, under Cmdr. Rolland A. Helsel, ten buyers award contracts for over 100 classes of materials (see chart). NASO purchases include re-orders from manufacturers after initial purchase on spares for specific plane types; large quantities of standard hardware and accessories; and raw material for maintenance work.

Last year, NASO handled over $500 million worth of procurement. It will probably handle even more this year.

▶ **Bidders List**—Currently, over 17,000 manufacturers are on NASO's bidders list to receive bid invitations. These names are carefully sorted and manufacturers receive notification of invitations for material which he has indicated previously he can produce.

There are two ways to get on Naval Aviation Supply Office's bidders list:

• **If you, or a representative** of your firm, can go directly to the Philadelphia office, it will be possible to secure a copy of Form 4548, a mailing list questionnaire. This form incorporates basic questions about your company, and has space for signature by a "responsible officer" of the firm. While it is not mandatory that a responsible officer sign, Navy prefers it, so bear this in mind if you plan to send a salesman or representative to Philadelphia in order to secure the form.

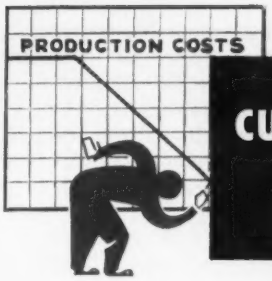
Along with the questionnaire you will receive a supplementary form, consisting of items which are purchased by NASO. On this you are to indicate which of the commodities listed you are prepared to supply.

For its own protection, NASO will usually make a spot check through its inspection offices to determine whether the applicant is an authorized supplier "capable of meeting government requirements."

• **If it is impossible** for you, or a representative of your firm, to go directly to Philadelphia, do this:

Write to the Aviation Supply office, Oxford avenue and Martin's Mill road, Philadelphia 11, Pa., Attention PGO-A, and request the forms. If you desire, enclose with your letter a catalog, or descriptive list of the merchandise you manufacture or handle.

No matter which method you use, NASO will not notify you directly whether or not you are qualified to bid. Your notification will come when you begin to receive bid invitations.

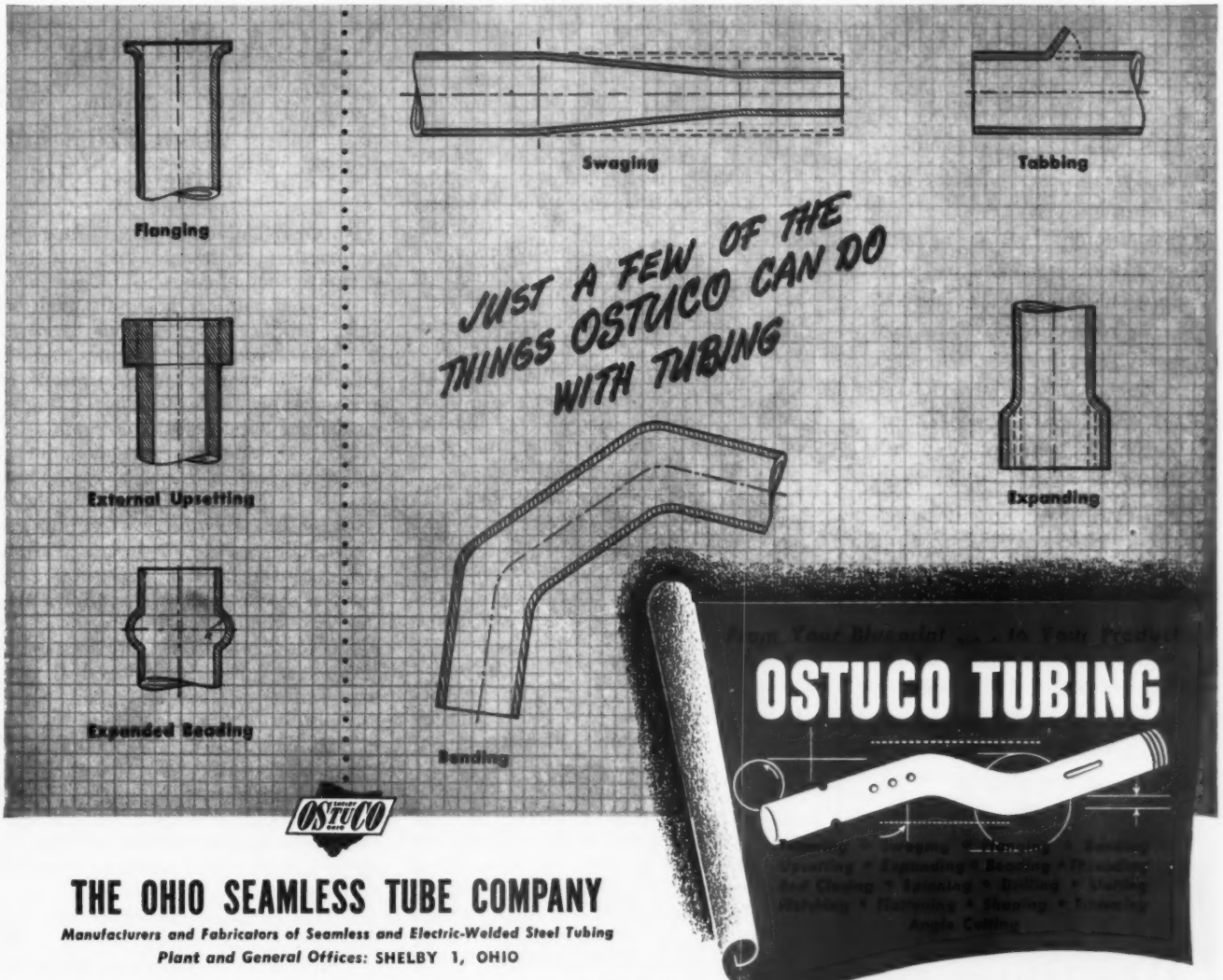


CUT YOUR PRODUCTION COSTS WITH OSTUCO TUBING

On a wide variety of aircraft parts—from landing gears to fuel lines—the majority of U. S. plane builders are cutting production costs and improving quality, with OSTUCO Aircraft Tubing. Perhaps you can do the same.

OSTUCO Aircraft Tubing is noted for its inherent *strength without weight* advantages and the ease with which it can be machined, formed, and fabricated. Furthermore, OSTUCO's "single source" operation saves you money on bending, shaping, flanging, beading, expanding, reducing, and many other operations required in preparing the tubing for your particular needs.

OSTUCO made the first "Chrome-Moly" ever produced for aircraft use, and is one of the nation's largest suppliers of aircraft tubing—widely recognized for precision craftsmanship and low percentage of rejects. Prompt deliveries can be assured from special alloy steel inventories and from a wide range of tube sizes carried on hand for engine, aircraft mechanical, and airframe tubing parts—all produced to Army, Navy, and AMS specifications. Write direct or to our nearest Sales Office for new free booklet "Fabricating and Forging Steel Tubing."



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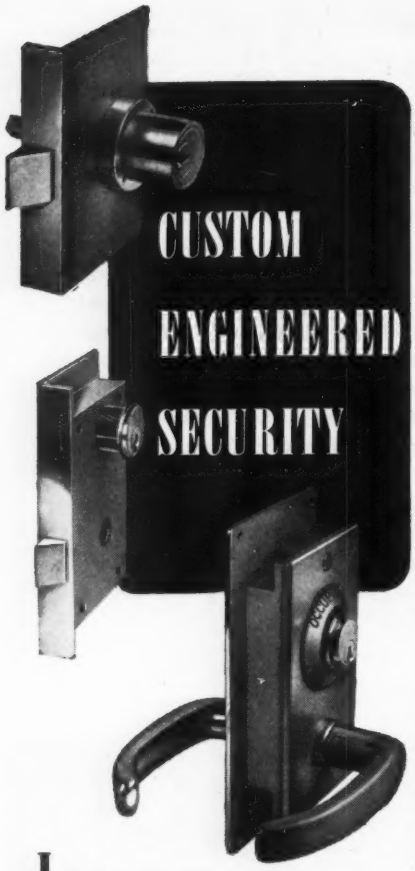
Sales Offices: CHICAGO, Civic Opera Bldg., 20 North Wacker Dr. • CLEVELAND, 1328 Citizens Bldg. • DAYTON, 1517 E. Third Street • DETROIT, 2857-E. Grand Blvd. • HOUSTON, 6833 Avenue W, Central Park • LOS ANGELES, Suite 300-170, So. Beverly Drive, Beverly Hills • MOLINE, 617 15th St. • NEW YORK, 70 East 45th St. • PHILADELPHIA, 1413 Packard Bldg., 15th & Chestnut • ST. LOUIS, 1230 North Main St. • SEATTLE, 3104 Smith Tower • SYRACUSE, 501 Roberts Ave.
CANADIAN REPRESENTATIVE: Railway & Power Corp., Ltd., NEW GLASGOW, MONTREAL, NORANDA, NORTH BAY, TORONTO, HAMILTON, WINDSOR, WINNIPEG, EDMONTON, VANCOUVER



IT'S Always something better at ADAMS-RITE. Locks and latches that secure fuselage, compartment, lavatory or bulkhead doors are especially designed here by lock specialists to fit the requirements of the product . . . rather than forcing a product to fit the restrictions of a standard model lock. For this reason, we are the acknowledged authority on aircraft latching devices . . . to the point of supplying 90% of such equipment in use on larger aircraft. The creative men at ADAMS-RITE offer to save you engineering and experimental time on your locking problem. Such assistance is yours for the asking whenever you need it.

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FOR NEARLY A HALF CENTURY

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You will find, however, that if bids are not submitted after receiving three or four invitations, Navy department may cross you from its listing.

► **Points to Remember**—If you should decide to submit a bid on an item, here are some points to remember:

• **Make sure you read** the specifications thoroughly and are able to comply in every respect. Each invitation will tell whether bidders are required to submit samples as part of the invitation. Some may not require samples, but may contain a paragraph instructing sucessful bidders to submit "pre-production" samples on each item for which award is received.

These invitations are explicit in the instructions, which even specify packaging, packing and marking of items.

• **Make sure you have** a working knowledge of procurement regulations, regarding payment, taxes, inspection, patents, termination for default, etc. These basic regulations are usually included in each bid packet and should be read thoroughly before submitting a bid.

• **NASO has a guide** which lists the time mail should consume in delivery from any point in the U. S. to the office. You can assume, if you allowed sufficient time for postal delivery, that your bid will be considered. If there is postal delay, but the postmark on the bid envelope indicates the bid was mailed so that under normal conditions it would be received in time to be considered, NASO will include your bid provided no award has been made, although it may be hours after the other bids were opened and recorded. This ruling, incidentally, may be the reason your representative leaves NASO with the assumption that your firm is low bidder, only to find later that another bid has been received—and its tardiness justified—which is still lower.

► **Result Cards**—Included in each bid packet is a return card which suppliers are to fill out and return with the bid. The card states: "You were not the successful bidder on invitation blank. Your cooperation in quoting on Navy invitations is appreciated." On the reverse side is space for you to fill in your firm's name and address. In this way, NASO feels, there will be no delay in advising suppliers of the results of bid competitions.

Naval Aviation Supply Office handles both negotiated and advertised contracts, with the dollar value divided at roughly 50-50 between the two. Over 90 percent of negotiated procurements by NASO are predetermined because of the sole source of supply set up by Navy's Bureau of Aeronautics in initial procurement of these items—mostly replacement parts and assemblies.

► **Public Rooms**—There are two so-called public rooms at the Philadelphia installation: one, just inside the entrance to the supply office, issues all invitations to bid; the other, on the main corridor, has posted all invitations and contract awards. To secure invitations from the former, you must know the number and opening date, which are entered on blank forms, along with your firm's name and address.

Main room for suppliers or their representatives is the latter, which is open from 8 A.M. to 4:30 P.M. Monday through Friday. Public opening of bids takes place here, usually at 10 A.M. each day.

► **Files**—After bids have been opened, duplicate copies of each bid are available for analysis by suppliers or their representatives, until the bids are abstracted. Then they are filed in binders numbered according to the date of public opening. These binders are all available in the public room.

Suppliers can arrange for conferences with any NASO buyer (see chart) by contacting the receptionist in Room 2022, Buyers Division.

NACA Buying

Research group will spend about $20.5 million during fiscal 1950.

National Advisory Committee for Aeronautics represents an important buying agency of the U. S. Government in the aeronautical field, although its only product is research reports. NACA's diversified scientific research activities demand the procurement of a remarkably wide variety of highly specialized supplies and equipment.

Largest items in dollar volume at the three NACA research laboratories are the huge wind tunnels and related instrumentation, which cost as much as $7 million for a single installation. However, the NACA is an important purchaser of standard supply items, stocking about 20,000 items at its Langley Aeronautical Laboratory; 12,000 at its Ames Aeronautical Laboratory and 25,000 at its Lewis Flight Propulsion Laboratory.

► **1950 Buying**—With a total of 236 employes in procurement activity at its three regional offices, the NACA will buy about $8 million worth of supplies and equipment in addition to about $12.5 million worth of construction during the 1950 fiscal year.

NACA is subject to public law 413, the Armed Services Procurement Act of 1947, and its purchases are, therefore, on an advertised bid-low bidder basis. However, due to the highly specialized nature of much of its construction work, about 20 percent of its total dol-

lar volume is on a negotiated contract basis.

Selling to NACA customarily is handled first by a request to one of the six buyers listed below for entry on their bid invitation list. After being entered on this list, the supplier will receive copies of bid requests on all items which he may be able to produce. These bidder lists are maintained at the local station. Headquarters office in Washington, D. C., serves solely as a policy guidance and budgetary control office.

▶ **Procurement Officers**—Each of the three NACA laboratories maintains two separate buying departments, one for the procurement of supplies and equipment from regular funds and a separate department to handle construction authorization work. These are procurement officers at the three laboratories: Sherwood L. Butler, Procurement Officer, Langley Aeronautical Laboratory, Langley Air Force Base, Va.; William Dey, Jr., Procurement Officer, Lewis Flight Propulsion Laboratory, Cleveland Airport, Cleveland, Ohio; and Alvin S. Hertzog, Procurement Officer, Ames Aeronautical Laboratory, Moffett Field, Calif.

These are representatives of the contracting officer on construction projects: John C. Messick, Chief, Engineering Services Division, Langley Aeronautical Laboratory, Langley Air Force Base, Va.; James R. Braig, Contract & Construction Administrator, Lewis Flight Propulsion Laboratory, Cleveland Airport, Cleveland, Ohio; and John F. Parsons, Representative of the Contracting Officer, Ames Aeronautical Laboratory, Moffett Field, Calif.

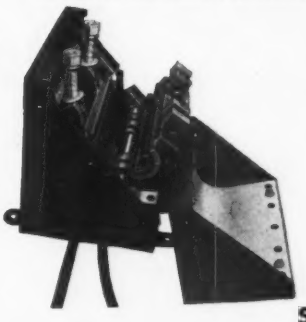
▶ **Breakdown**—During fiscal 1950, the NACA will spend about $3.5 million at its Langley laboratory for supplies, equipment and other contractual services. This laboratory (which includes the Wallops Island testing station and the high speed flight research station at Muroc Air Force Base, Calif.) will contract for about $8 million, including an 8-ft. transonic wind tunnel and an addition to the instrument laboratory.

The Ames laboratory will contract for about $.5 million in general construction work. About $4 million will be obligated at the Lewis Laboratory for an instrument laboratory and additions to propulsion sciences laboratory.

All laboratories will spend about $4 million during the current fiscal year on various supplies and materials, including abrasives, coatings and preservatives, compositions, cutting tools, drafting and artist supplies, electrical and radio, fuels, gases and lubricants, hardware, janitorial, lumber and building, maintenance and operating, mechanical, medical and safety, metals, office, photographic and reproduction, pipes, valves and fittings, scientific and welding and soldering equipment.

KEEP CABLE ON THE JOB LONGER

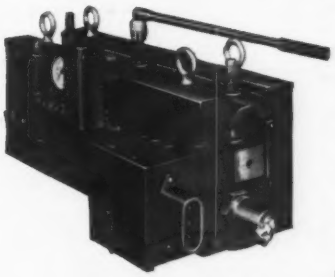
Scrap piles of bruised and broken power cables, similar to the one pictured above, needlessly cost American Industry thousands of dollars each month. Vulcanized patching and splicing *with heat* is the only effective way of combating this waste. Why take chances with temporary cold-taped splices when permanent repairs can so easily be made with a MINES vulcanizer? Simple to operate (instructions provided) MINES vulcanizers quickly pay for themselves through savings their use effects in production schedules and cable replacement costs.



DIRECT HEAT MODELS

Designed for work on cords and small cables. No. VDIR4B Bench Type 500 watt A. C. model illustrated. Available also in 500 watt or 1200 watt units packed in sturdy light weight steel carrying case that accommodates molds and supplies. Thermostatic heat controls are fully automatic.

STEAM HEATED MODELS



Available in five models rated from 1500 to 5000 watts at standard applicable A. C. & D. C. voltages. Self contained generator consists of electric immersion type heaters and an automatic steam activated switch that controls current flow. All sizes also equipped with pressure gauge, safety pop-off valve and air vent.

MOLDS and SUPPLIES

Available for all standard cable and cord diameters MINES aluminum vulcanizing molds are accurately machined in two identical half-sections.

Special tapes, cement and anti-stick compounds for molds make it easy to create watertight and wear-resistant splices. Neoprene tape and cement now available for splicing or patching Neoprene cables.

For Complete Details—ask for your free copy of Bulletin RV-106 and price list No. 104 . . . or describe your needs and we will quote without obligation.

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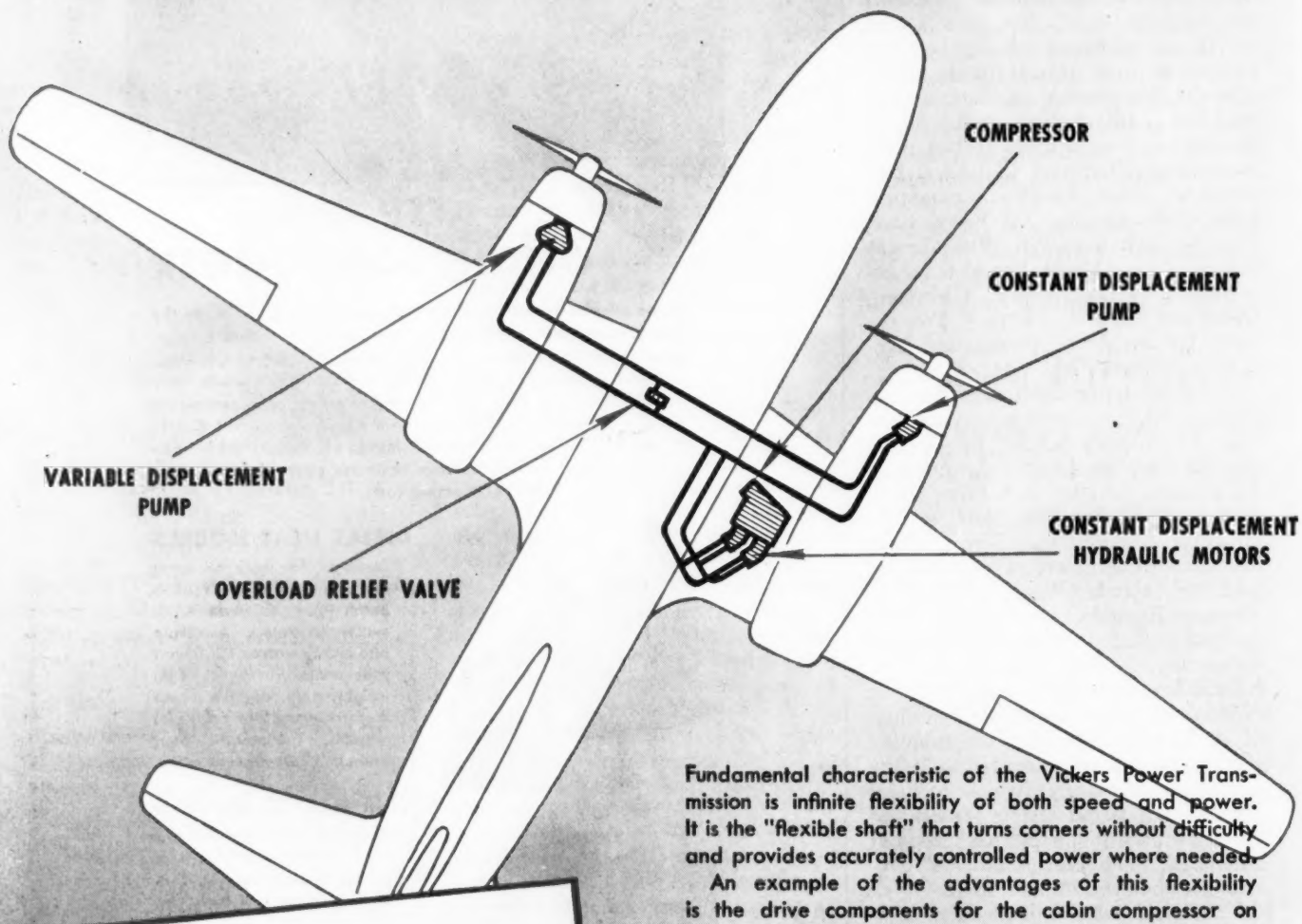
VICKERS HYDRAULICS

Provides the "variable speed shaft" that

turns corners with ease and delivers power where needed



Fundamental characteristic of the Vickers Power Transmission is infinite flexibility of both speed and power. It is the "flexible shaft" that turns corners without difficulty and provides accurately controlled power where needed.

An example of the advantages of this flexibility is the drive components for the cabin compressor on Convair-Liners. There are numerous other applications where it is desirable to transmit power to a point remote from the power source and provide selective variable speed or constant speed. These applications are easy with Vickers Transmissions.

The Convair-Liner also uses Vickers Hydraulic Pumps and Controls for the 3000 psi main hydraulic system. In Vickers complete line of aircraft hydraulic equipment, you will find a combination to meet your control or drive needs exactly. Our engineers are available to help you solve your particular problem.

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A Primer on Military Procurement Laws

Here are the answers to questions raised by current Congressional legislation affecting the services.

A military contractor who seeks to manufacture for the USAF or the Navy without guidance on basic laws governing armed services procurement is like a pilot with five hours solo who wants to fly on instruments. He should never try it!

Boundaries for procurement activities of the Department of Defense and for the firms with which it deals are laid out rather broadly, in most cases, in the laws enacted by Congress. But there are boundaries, nevertheless, to be observed, with penalties for non-observance.

Here is an AVIATION WEEK round-up of the most essential provisions of military procurement laws:

▶ **Size of Airfleets**—Legislation (HR 1437) passed by the House and Senate and now before a joint conference committee would set an authorized aircraft strength of 24,000 planes or 225,000 airframe tons for the USAF. Choice is left to the Air Force Secretary as to which yardstick is more appropriate to fulfill requirements.

The measure, however, makes no declaration of policy as to when—if ever—this authorized ceiling is to be met. One aviation leader commented: "A ceiling of 1 million planes might as well have been laid down, since there is no indication that the authorized strength is a goal to be worked toward and accomplished." Under its 1950 fiscal year budget—not yet finally decided—USAF's strength probably will approximate 9800 planes.

A July 19, 1940 Act (P.L. 757, 76th Cong.) set the authorized aircraft strength of the Navy at 15,000 planes. A 1942 statute (PL. 612, 77th Cong.) authorized the Navy to have 200 lighter-than-aircraft. Over the current fiscal year, the Navy plans operation of 5,582 regular and 2,183 Naval Reserve planes. The regular Navy plans to operate 16 lighter-than-aircraft and the Reserve, two.

▶ **How Many Planes Annually?**—There is no law on the books to direct or guide the Secretary for Air, Secretary for Defense, Bureau of the Budget (representing the President) and the Congressional appropriations committees in allowing funds annually for new aircraft. It is decided each year, first tentatively by the administration, acting on the advise of the Joint Chiefs of Staff, and finally by Congress in allowing funds.

House version of legislation setting the authorized Air Force strength (HR 1437) would allow USAF to purchase up to 5200 new planes or 42,500 airframe tons annually. Senate, however, struck out the provision with the explanation that this should be determined from year to year by the appropriations committees.

▶ **Long-Range Procurement**—Long-range aircraft procurement programs have been favorably looked upon by Congress since war's end and probably will eventually have a basis in standing law.

House version of the Air Force authorization bill (HR 1437) provides that appropriations for plane procurement and research and development shall remain available until expended.

Senate version provides that funds appropriated for research and development and procurement of "technical military supplies and equipment"—a term which would include aircraft—shall remain available until expended "unless the appropriation act provides to the contrary."

The 1950 fiscal year Department of Defense appropriation bill (HR 4146), now before a joint House-Senate conference committee for final Congressional action, stipulates that funds for Naval and Air Force plane procurement and research and development shall remain available until expended.

▶ **Joint Plane Procurement**—Recently-enacted Unification Act (P. L. 216, 81st Cong.) clearly gives the Secretary of Defense authority to consolidated or coordinate the aircraft procurement and aviation research and development programs of USAF and Navy. The new budgetary organization for the Department laid out in the act would be conducive to this. It establishes two budget officials in each of the three services functioning under a comptroller of the Department of Defense.

▶ **Competitive-bid or Negotiated Contracts**—The 1947 Procurement Act (P. L. 413, 80th Cong.), which lumped together and modernized previously scattered laws and regulations dealing with military procurement, declares a policy of competitive-bid contracting, but numerous exceptions give USAF and Navy virtually a free hand to negotiate plane contracts, as well as aviation research and development contracts. It is stipulated that contracts may be negotiated if:

(a) "Public exigency will not admit the delay incident to advertising;

(b) "For supplies or services for which it is impracticable to secure competition;

(c) "The agency head determines that the purchase or contract is for experimental, developmental, or research work, or for the manufacture or furnishing of supplies for experimentation, development, research, or test;

(d) "For supplies or services as to which the agency head determines that the character, ingredients, or components thereof are such that the purchase or contract should not be publicly disclosed;

(e) "For equipment which the agency head determines to be technical equipment, and as to which he determines that the procurement thereof without advertising is necessary in order to assure standardization of equipment and interchangeability of parts and that such standardization and interchangeability is necessary and in the public interest; . . . .

(f) "For supplies of a technical or specialized nature requiring a substantial initial investment or an extended period of preparation for manufacture, as determined by the agency head, when he determines that advertising and competitive bidding may require duplication of investment or preparation already made, or will unduly delay procurement of such supplies; . . . .

(g) "The agency head determines that it is in the interest of the national defense that any plant . . . . or facility or any producer, manufacturer, or other supplier be made or kept available for furnishing supplies or services in the event of a national emergency, or that the interest either of industrial mobilization in case of such an emergency, or of the national defense in maintaining active engineering, research and development, are otherwise subserved; . . . ."

▶ **Competitive-bid Rules**—The 1947 Procurement Act (P. L. 413, 80th Cong.) provides that advertisement for bids shall be "a sufficient time previous to the purchase or contract"; specifications and invitations shall permit "full and free competition"; "all bids shall be publicly opened at the time and place stated in the advertisement"; and award shall be made "to that responsible bidder whose bid, conforming to the invitation for bids, will be most advantageous to the government, price and other factors considered."

All bids may be rejected if it is considered "in the public interest to do so". A negotiated contract may then be entered into, provided that its price is lower than the rejected competitive bid bids and the lowest negotiated price offered by a "responsible" supplier.

Should evidence of collustion in bidding be ascertained, the Department is

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The ZERO READER takes its place in a long chain of Sperry "firsts" including the Gyro-Horizon, Directional Gyro, Gyrosyn Compass and Gyropilot. Like them, it was evolved from Sperry research, engineering, precision manufacture and flight testing.

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directed to refer the case to the Justice Department for possible anti-trust action.

▶ **Cost-plus Contracting?**—The 1947 Procurement Act (P. L. 413, 80th Cong.) bars cost-plus-a-percentage-of-cost contracts and sets a maximum fee of 10 percent (15 percent on research and development contracts) on cost-plus-fixed-fee contracts.

Under cost-plus-fixed-fee contracts, the contractor is required to notify the agency of any cost-plus-fixed-fee subcontracts or any fixed-price subcontracts of over $25,000 he intends to let. Procuring agency has the right "to inspect the plants and to audit the books and records" of the prime contractor and of any subcontractor working on a cost-plus-fixed-fee basis.

▶ **Agents for Obtaining Business?**—There is no law barring engagement of brokers or agents to secure legitimately-transacted competitive-bid business. Their fees, commissions, or salaries can be charged against the contract obtained.

The law aimed at eliminating middlemen in contract negotiation is flimsy. It (P. L. 413, 80th Cong.) requires that each negotiated contract carry a stipulation "that no person or selling agency has been employed or retained to solicit or secure such contract upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, *excepting bona fide employes or bona fide established commercial or selling agencies maintained by the contractor for the purpose of securing business.*" For violation, the contract may be either annulled "without liability" or the outlay to the agent deducted from the contract price. The law rules out a "selling agency" but permits a "bona fide established . . . . selling agency".

Legislation now pending in Congress (S. 2371) would clamp down harder on middle-men. It would require contractors to file extensive data on all persons who had directly or indirectly represented the contractor in connection with the obtaining of government business. Persons who for more than two years had served as officer, partner, or employe of the contractor would be exempted.

▶ **Ex-Government Officials as Firm Representatives?**—A 1948 act (P. L. 772, 80th Cong.) bars all former government employes, for a period of two years, from acting as "counsel, attorney, or agent for prosecuting any claims against the U. S." involving matters with which they were "directly connected or performed duties" while in government service, under penalty of one year imprisonment, $10,000 fine, or both.

Legality of former government employes prosecuting claims against the U. S., for a two-year period, involving matters with which they had no connection while in government service will be a question after June 30, 1950—unless Congress acts in the meantime.

An 1872 act (U.S.C., Title 5, Sec. 99) flatly bars ex-government employes, for a two-year period, from prosecuting any claim against the U. S. This would make it illegal, for example, for a Department of Agriculture employe to represent an aircraft firm in a claim against the U. S. for two years after severance from his government post. Part of the law was suspended for the period from May 27, 1940 to June 30, 1950 by other legislation (P. L. 93, 80th Cong.; P. L. 137, 80th Cong.) limiting its application only to maters with which the employe was directly connected while in government service. This means that until June, 1950, a former government official can represent a firm on a claim case against the government, as long as he was not connected with the subject matter while in government service.

The 1872 act is a civil statute. Legal question which arises after June, 1950 is: Whether (1) the 1948 act was only intended to make prosecution of claims by ex-government employes on matters they had dealt with while in government service a criminal offense subject to criminal penalty; or, whether (2) it was intended to supersede the 1872 act.

▶ **Advance Payments**—The 1947 Procurement Act (P. L. 413, 80th Cong.) permits the procuring agency to make advance payments on negotiated contracts "only upon adequate security." It is provided that terms "may" include "a lien in favor of the government, paramount to all other liens, upon the supplies contracted for, upon the credit balance in any special account in which such payments may be deposited and upon such of the material and other property acquired for performance of the contract. No provision is made for advance payment on competitive-bid contracts.

▶ **Labor Rates on Defense Contracts**—All contracts of over $10,000 let by the Department of Defense are subject to the Walsh-Healey Act requirement that minimum wages—as determined by the Secretary of Labor to be prevailing minimum wage for the type of work—shall be paid workers. Such contracts are also subject to the act's requirement for a maximum 40-hour week for workers, unless longer hours are compensated for in accordance with overtime provisions of the Fair Labor Standards Act.

▶ **Profits on Aircraft Contracts**—The provision of the 1934 Vinson-Trammel Act setting a profit ceiling of 12 percent on both Air Force and Naval aircraft contracts is still on the books. It has been suspended over the war and postwar years by a series of acts. The 1950 fiscal year Department of Defense appropriation bill will void it for the current year. However, several attempts in Congress to repeal the limitation over the past few years have failed. This is largely because the repealer was bundled together with another provision repealing the act's requirement that 10 percent of Naval aircraft be manufactured in government plants, serving as yardsticks on costs. Pennsylvania congressmen—protecting the only government aircraft factory at Philadelphia—have been largely responsible for blocking repeal of both provisions. Provision requiring government manufacture of aircraft has been kept in abeyance by presidential discretion.

The wartime method of limiting profits, by authorizing the departments to renegotiate contracts, was re-enacted by the 1948 Supplemental National Defense Appropriation Act (P. L. 547, 80th Cong.). Under this, all contracts and subcontracts over $1000 are subject to renegotiation if total contracts of a contractor for the fiscal year aggregate over $100,000.

The renegotiation authority will be continued by the 1950 fiscal year Department of Defense appropriation bill. Under the Senate version of the measure, now in conference, only negotiated contracts are subject to renegotiation.

▶ **Contract Termination**—In the absence of law on the subject, the Department of Defense has a free hand to stipulate cancellation settlement terms in contracts. Settlements are subject to review and possible recapture by the General Accounting Office. The extent of GAO's authority to investigate and override settlement determinations by the services is in active dispute.

Without success, the aircraft industry has urged peacetime legislation (S. 419) drawn along the lines of the now-defunct 1944 Contract Termination Act which applied to wartime business. This would authorize negotiated cancellation settlements and permit GAO to reopen settlement cases only in the event of fraud. At present, contractors are left uncertain as to whether GAO will decide to reopen a settlement.

How to Sell Under ERP

Economic Cooperation Administration has established an Office of Small Business to aid small independent enterprises of the U. S. who are seeking overseas business under the European Recovery Program. Manufacturers wishing to learn more about this field should communicate with the Special Assistant to the Administrator for Small Business, ECA, 800 Connecticut Ave., N.W., Washington 25, D. C.

lubricated and sealed for life . . .

ANGLEGear units are furnished in all four models lubricated and sealed for life to eliminate the maintenance problem. The use of hardened alloy steel bevel gears and precision ball-bearings guarantee long trouble-free service.

ANGLEGear units may be used for either manual operation or for power transmission. Present models are typically rated to transmit ⅓ H.P. at 1800 R.P.M. for 2500 hours continuous duty. *All models now rated 500 inch pounds ultimate static torque.*

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Greatest proportion of trade under ECA is from businessman to businessman. The foreign businessman purchaser pays government the dollar equivalent in his national currency (lira, franc, guilder, etc.), for goods to be bought, and ECA dollars allotted to his country are then used to purchase the commodities he wants from American business firms.

▶ **Government Purchases**—Foreign government missions and agencies under their supervision also buy certain commodities, and in a few specific instances U. S. government agencies do the buying for some foreign countries. (Example: Bureau of Federal Supply, 7th and D Sts., S. W., Washington 25, D. C., is purchasing Korea's requirements.)

ECA officials suggest a thorough preliminary analysis of the product to be sold, to determine whether it is a non-luxury item which will be in volume demand in the ECA countries.

▶ **Information Sources**—Sources of information helpful in making such an analysis include the 42 field offices of the Department of Commerce in principal cities throughout the country, foreign trade department of the Chamber of Commerce in the manufacturer's area, American export-import trade associations, foreign trade publications and foreign department of the manufacturer's bank.

ECA officials warn against futility of a "one-shot" sales effort in foreign business and urge a continuous sales program as the only logical way of expanding sales volume. Companies entering the field for the first time may choose to handle sales directly to European importers, or sell indirectly through American export agents, export merchants and combination export managers who work for several non-competing manufacturers.

Under the ECA guaranty program American manufacturers are permitted to establish plants in Marshall Plan countries or to make arrangements for a foreign manufacturer to make their products overseas, with a contract of guaranty from ECA. This contract guarantees the convertibility of foreign currency into U. S. dollars for the amount of dollars invested plus actual earnings or profits on the investment to the extent of 75 percent earned during the guaranty period up to Apr. 3, 1962.

No guaranty is given, however, for ordinary business risks, fluctuations in rate of exchange or political hazards: Manufacturers interested in establishing a foreign manufacturing outlet under this plan are invited to write to the Director of Guaranties and Loans at the ECA Washington address cited above, for additional information applying to their specific problems.

Torrington Needle Bearings handle heavy loads in minimum space in Republic F-84 Thunderjets

Higher flying speeds mean greater bearing loads. So Republic Aviation Corporation found in developing the F-84 Thunderjet, first 600 mph fighter. In Torrington Needle Bearings, Republic secured the size, performance and life expectancy needed for ten important assemblies.

Little room for controls is left by a large air scoop in front and a long exhaust tube in back. Compact design of such units as the torque tube assembly, above, is essential. Needle Bearings accommodate large shafts in relatively small housings, providing great strength in minimum space.

Rudder pedal application of Needle Bearings shows the full complement of small diameter rollers. These efficient bearings provide greater load capacity than any other anti-friction bearing of comparable size. Close tolerances assure minimum play and quick response on the controls.

Type AT self-aligning Needle Bearings are used in the aileron booster control. Inset shows the spherical bore shell and mating housing that provide automatic self-alignment. After a 200,000 cycle test, that exceeded actual service conditions, Needle Bearings still functioned perfectly.

Torrington Needle Bearings lend themselves ideally to the lightweight, compact, high capacity designs essential in modern aircraft. Our engineers will gladly help you adapt anti-friction Needle Bearings to your requirements. Write us today. THE TORRINGTON COMPANY, Torrington, Conn., or South Bend 21, Ind. District offices and distributors in principal cities of United States and Canada.

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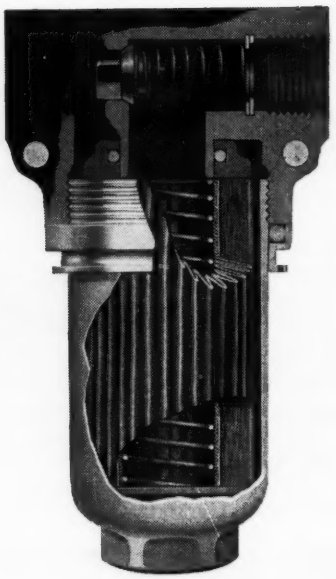

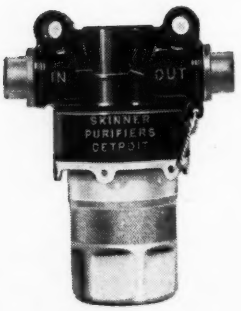

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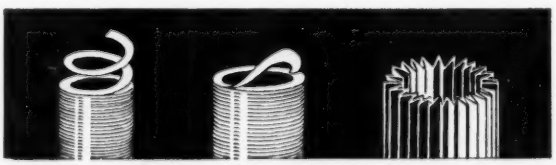

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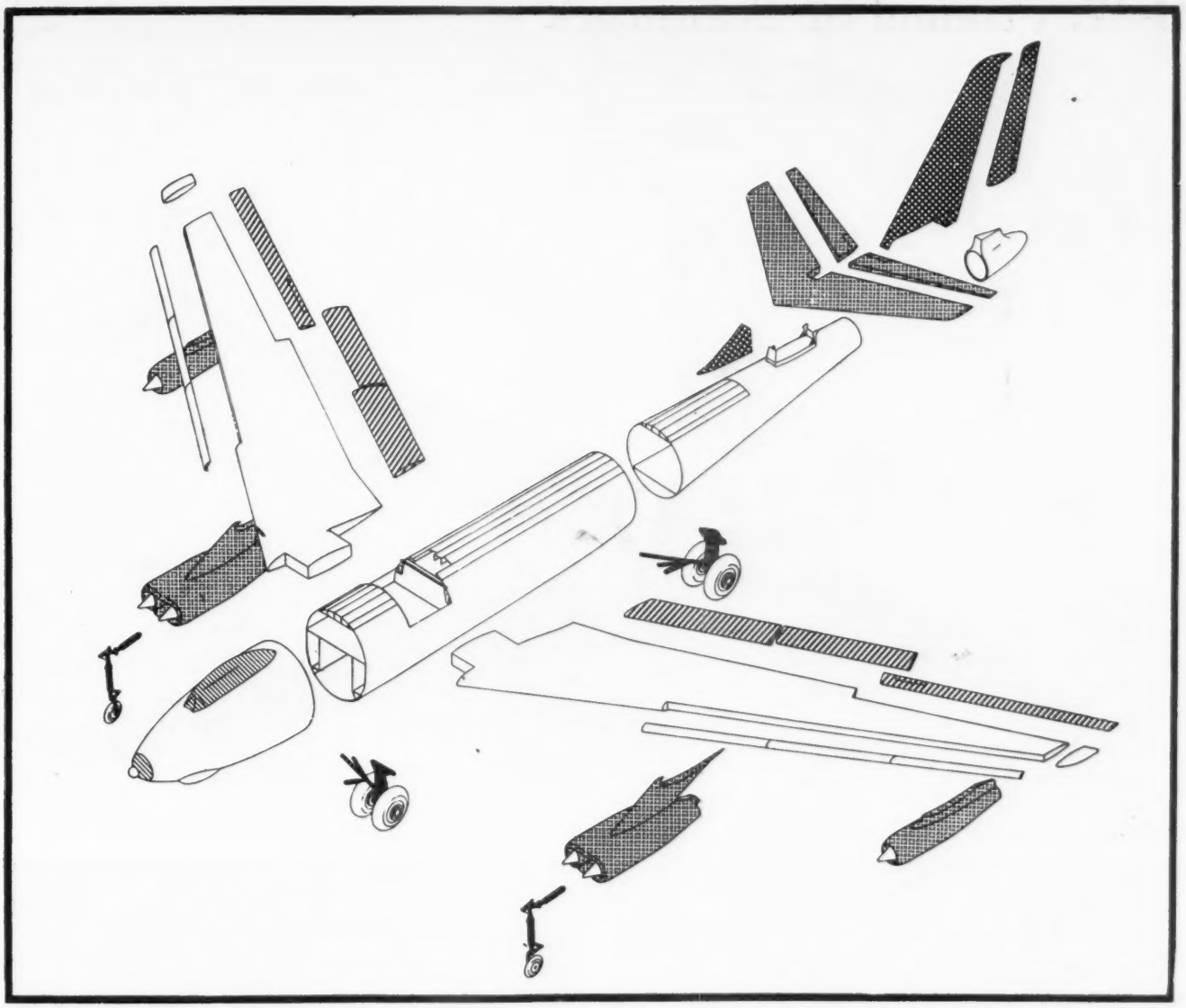


SHADED COMPONENTS in this exploded B-47 view are produced by companies other than Boeing, maker of the aircraft.

Subcontracting Works for the Industry

Opportunities for subcontracts in fiscal 1950 are expected to be greater than in any postwar year as procurement policy points more and more toward utilization of additional sources of supply.

Two major examples of subcontracting on important USAF purchases—Boeing B-47 Stratojet bomber, and the General Electric J-47 turbojet engine which powers that bomber and other first line military jets—illustrate how the work may be spread among many manufacturers.

▶**Planned Production**—Boeing had an unusual opportunity to plan B-47 production in Wichita at its reopened Plant No. II.

Approximately 37 percent of the B-47 airframe was subcontracted early in 1949. Subsequent cutbacks in Boeing's other contracts and shifts in the total military procurement schedule resulted in a later readjustment eliminating some of the aircraft component contracts.

Principally affected were Martin and Curtiss-Wright. A primary engineering advantage of subcontracting is production planning of the airplane for breakdown into assembly components necessary to the completed airplane, yet leaving the parent company to make the most important fuselage and swept-wing main assemblies.

General Electric's program at Lockland, Ohio, in the plant occupied by Wright Aeronautical Corp. in World War II, is regarded by the AMC Industrial Planning Division as a major achievement. GE expects to reach peak production on its present contracts early in 1950, with approximately 1200 persons employed at Cincinnati. Yet very little of the engine is made by GE, and none of it is manufactured at Lockland.

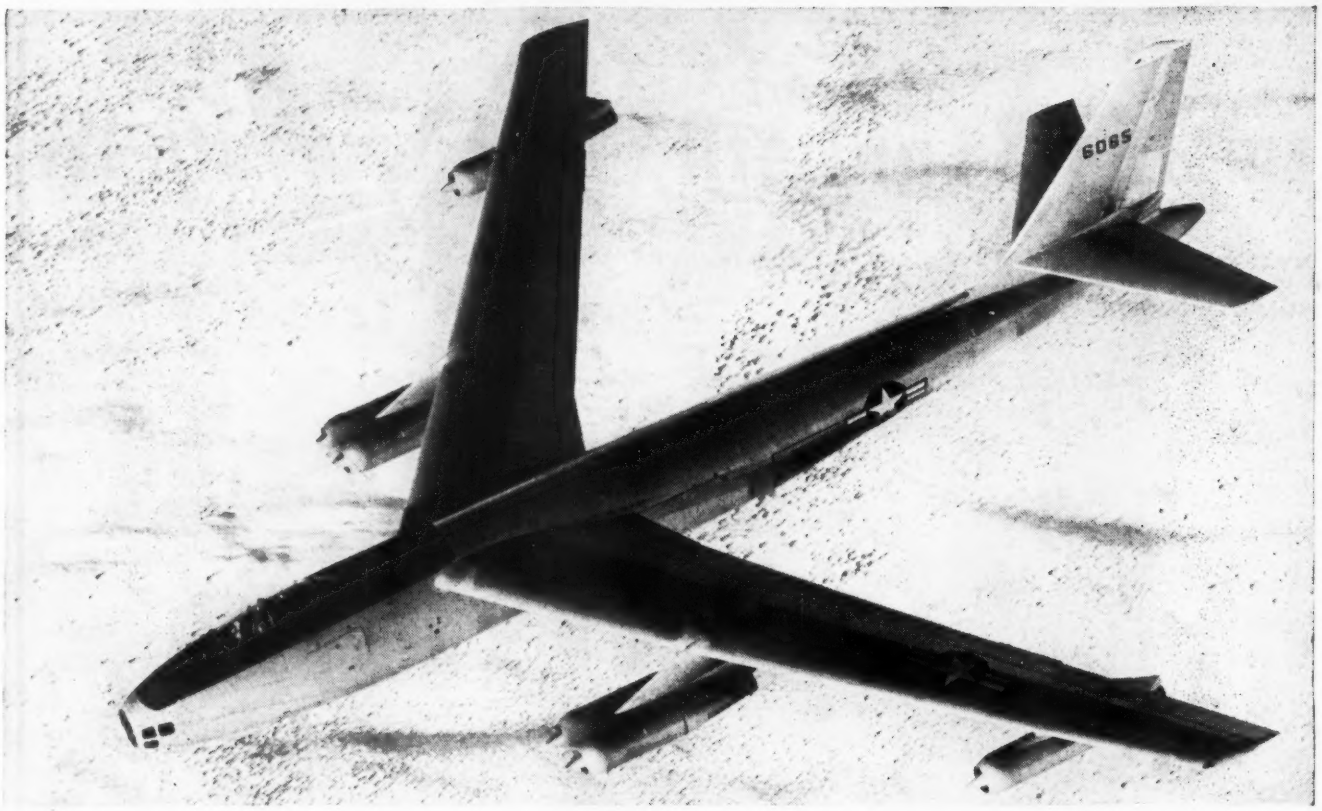
▶**Farming It Out**—Farming out the components of the J-47 to hundreds of small and large manufacturers is the method used. GE has listed some 280 major subcontractors (AVIATION WEEK, June 27).

USAF industrial planners estimate it would have cost approximately $42 million to activate the Lockland J-47 project if it were a complete manufacturing facility tooled to produce the engines which it is assembling. By making use of available tooling in plants all over the country through subcontracting, the project has cost only about $7 million, a saving of $35 million.

Best indication that subcontracting is on an uptrend is seen in an AMC report which showed as of July 1, 1948, 743 subcontractors who had "source inspection." On the same date in 1949, this number had increased to 1196.

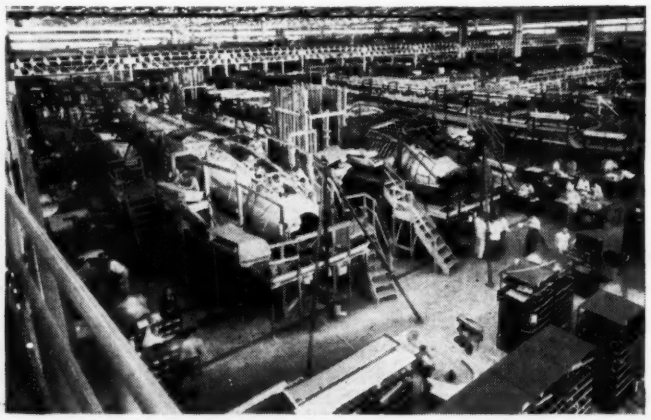
Turn to Next Page

B-47: Product of Teamwork

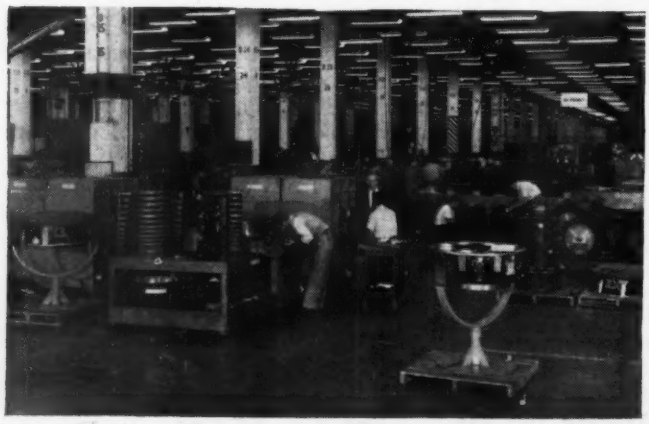


BOEING's six-jet bomber is composed of parts from many subcontractors who feed their output into Wichita where . . .

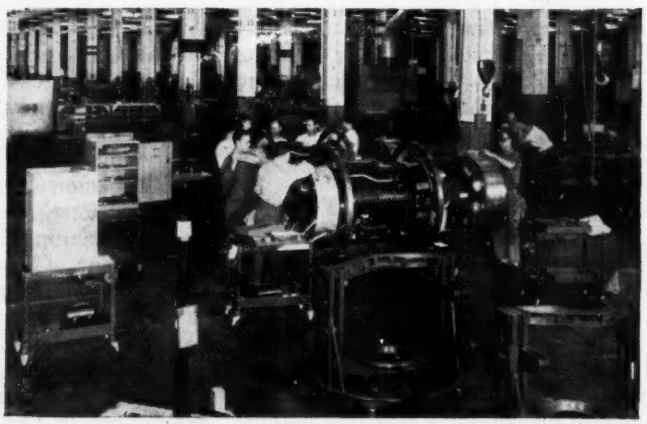
SWEPT WINGS are fabricated by parent plant, as well as . . .



FUSELAGES. Meanwhile, same system is used for engines at . . .



LOCKLAND where GE takes in components for assembly into . . .



FINISHED ENGINES which also are tested before shipment.

Here's the latest...

on Johns-Manville products

for reciprocating engine and jet-powered aircraft

Do you know the facts about J-M's new feather-weight Thermoflex Insulation Blanket for insulating jet engine exhaust cones and tail pipes?

Have you heard about Clipper Seal—the J-M oil seal of simplified design for protecting bearings on crankshafts and propeller assemblies?

Are you posted on the advantages of flameproof J-M asbestos cloth for combustion and exhaust-assembly insulation and fireproofing . . . on J-M packings that do such jobs as sealing cross-ignition tubes and exhaust cone flanges better because they withstand temperatures up to 2000°F?

To get a good "briefing" on these and other recent Johns-Manville product developments for the aviation industry, send for brochure AV-1A. It's full of useful information on sizes, types, weights and properties—data that's sure to be helpful, whether you're in engineering, purchasing, drafting, maintenance or research.

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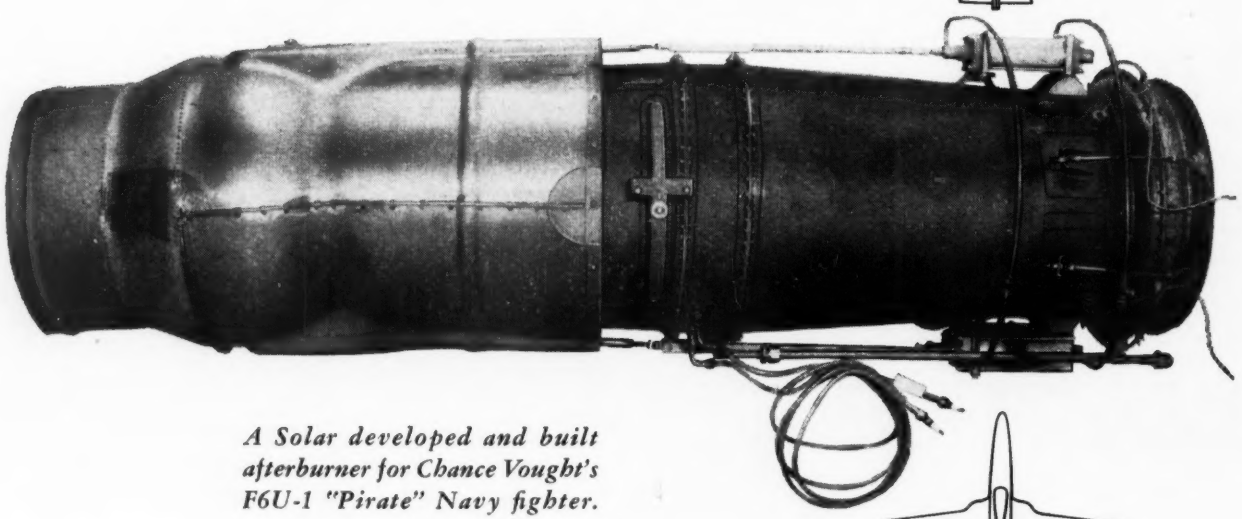
Solar Afterburners now on Production Aircraft!



A Solar developed and built afterburner for Chance Vought's F6U-1 "Pirate" Navy fighter.

As a result of a comprehensive three-year engineering program, Solar has developed an afterburner which, with the Westinghouse J34 turbo-jet engine, forms a combination that is the first to be used on production aircraft in the United States.

During these three years, Solar has successfully designed and manufactured complete afterburning units for the J31, J33, J34 and J35 turbo-jet engines, accumulating over 2,000 hours of total test time on engines in the laboratory and in actual flight.

Efficiency and serviceability of Solar afterburners is continually being improved by research and development. Because of this experience, the Company is now completely equipped to develop and fabricate experimental and production afterburners for any turbo-jet engine.

SOLAR
Aircraft Company

SAN DIEGO • DES MOINES • NEW YORK

$170 Million a Year for Avionics Program

Military-civil aviation planning groups begin spending to implement billion dollar all weather airways system.

The extensive, billion dollar all-weather airways system, blueprinted during the past 18 months by joint military-civil aviation planning groups, is now moving forward toward implementation at an annual rate of about $170 million in procurement of new avionics equipment.

Next to procurement of aircraft and engines, federal expenditures on avionics equipment loom as the largest single item for procurement during the next five years. Slightly more than $170 million already has been earmarked out of the fiscal 1950 federal budget for procurement of avionic equipment. These funds include.

- **Civil Aeronautics Administration—$40 million** in cash and contract authority for avionic equipment to augment the civilian phase of the joint all-weather airways program.
- **U. S. Air Force—$115 million** in cash and contract authority for avionic equipment for the all-weather airways program; a global communications network; a radar warning network; aircraft identification systems; and communications coding.
- **Navy—$15 million** in cash and contract authority for avionic equipment for the all-weather airways program; test equipment; anti-submarine warfare devices; counter-radar equipment; and high volume production studies on avionic equipment.

Procurement of equipment for the all-weather airways system designed to cover the continental United States and main international air transport routes used by Military Air Transport Service and U. S. commercial airlines will be handled jointly by the CAA, USAF and Navy. Each agency will buy equipment to service the airfields and routes for which it is primarily responsible. Bulk of this equipment will be purchased by CAA which is responsible for equipping and maintaining the civil airways network in the continental United States, Hawaii and Alaska.

► **Research Phase**—Research and development phase of the all weather airways program is handled by the Air Navigation Development Board, headed by Ralph Damon, TWA president, with Dr. Maurice Ewing, former M.I.T. radar expert and RCA research executive, as technical director. Pattern for development of the complex new

"Avionics"

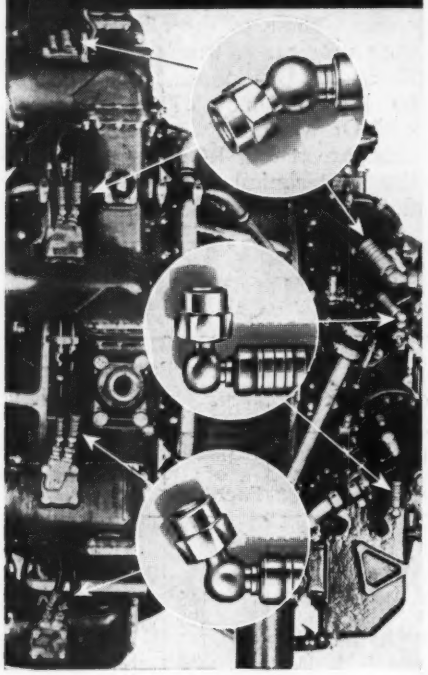
"Avionics" is a new word, coined by AVIATION WEEK as a simple and much needed term to describe generically all the applications of electricity to the field of aeronautics.

AVIATION WEEK believes you are seeing the term "Avionics" here for the first time. You will see it more, as this publication brings to its readers technical and non-technical news of highly important developments in the growing field of ground and airborne electrical equipment.

CAA Avionics Program

Type of Facility	Total 1950 Program		Balance Future Years Fiscal Years 1951 and 1952	
	Number of Facilities	Amount	Number of Facilities	Amount
Continental United States:				
VHF-ILS equipment (includes LF locators)	38	$4,294,000	145	$21,140,735
High intensity approach lights	13	1,335,685	295	41,716,152
Distance measuring equipment	560	15,043,226	153	5,314,670
Precision approach radar	13	2,340,000	54	17,613,522
Airport surveillance radar	19	4,332,000	106	39,791,987
Secondary radar	.....	.....	150	21,450,000
VHF-ADF equipment	44	601,392	106	1,707,118
VHF-omni-range	.....	.....	.....	.....
Mechanical interlocks	30	442,200	12	229,944
Airport time utilization	.....	.....	50	3,403,125
Approach control timing devices	15	495,000	31	1,125,300
Alaska:				
VHF-ILS equipment (includes LF locators)	4	560,000	5	931,230
High intensity approach lights	.....	.....	16	2,946,432
Distance measuring equipment	11	407,000	11	505,263
Precision approach radar	1	225,000	7	3,029,219
Airport surveillance radar	2	570,000	6	2,997,492
Secondary radar	.....	.....	12	2,287,992
VHF-ADF equipment	.....	.....	12	253,143
VHF-omni-range	.....	.....	5	421,505
Mechanical interlocks	.....	.....	.....	.....
Airport time utilization	.....	.....	.....	.....
Approach control timing devices	.....	.....	.....	.....
Pacific area:				
VHF-ILS equipment (includes LF locators)	.....	.....	7	1,303,722
High intensity approach lights	.....	.....	8	1,366,272
Distance measuring equipment	.....	.....	18	826,794
Precision approach radar	.....	.....	5	2,189,601
Airport surveillance radar	.....	.....	7	3,421,855
Secondary radar	.....	.....	8	1,525,328
VHF-ADF equipment	.....	.....	8	170,167
VHF-omni-range	.....	.....	4	337,204
Mechanical interlocks	.....	.....	.....	.....
Airport time utilization	.....	.....	.....	.....
Approach control timing devices	.....	.....	.....	.....
Caribbean area:				
VHF-ILS equipment (includes LF locators)	.....	.....	6	1,117,476
High-intensity approach lights	.....	.....	6	1,024,704
Distance measuring equipment	.....	.....	12	551,196
Precision approach radar	.....	.....	1	419,809
Airport surveillance radar	.....	.....	2	949,018
Secondary radar	.....	.....	2	381,332
VHF-ADF equipment	.....	.....	2	41,488
VHF-omni-range	.....	.....	6	505,806
Mechanical interlocks	.....	.....	.....	.....
Airport time utilization	.....	.....	.....	.....
Approach control timing devices	.....	.....	.....	.....
Total	.....	**$30,645,503**	.....	**$182,996,601**

AVICO
INTEGRAL ANGLE
HOSE COUPLINGS



AVICO integral *angle* hose couplings as used on Pratt & Whitney Turbo-Wasp Jet engine enable Design and Production Engineers to:

- **Save Space**
- **Start hose bends earlier**
- **Eliminate sharp hose bends**
- **Reduce Installation time**

Avico high pressure flexible pipes (AN-H-28 2-wire braid hose) and medium high pressure (AN-H-24 1-wire braid hose) can be supplied with integral angle couplings, straight couplings, "Tee's", and "Y" couplings. Write for descriptive leaflet.

Patents Pending

Special hose couplings to solve awkward installation problems our specialty. Send sketches for quotations.

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avionic equipment required for the program now works something like this:

1. **Nav panel** of the Air Coordinating Committee formulates the operational requirements of equipment for the civil-military common system.

2. **Navigation committee** of the Research and Development Board approves ACC operational requirements for the common system and adds any purely military requirements.

3. **ANDB**, through research and development contracts with private industry, gets experimental models of the required equipment; gives it a thorough serivce testing and then, after approval by ACC and R&DB establishes basic specifications for production models of the equipment.

4. **CAA, USAF and NAVY** buy the quitities of the production equipment they require to implement their share of the program. Key man in the civilian procurement program is Charles Horne, head of CAA's federal airways system. Maj. Gen. Harold M. McClelland, new electronics and communications director for the Defense Department, is the key man in the military program.

▶**Several Markets**—The avionics market is divided between the government agencies who buy ground equipment for permanent installation along the airway routes and military and commercial transport operators who purchase airborne equipment to enable planes to use the ground facilities.

Bulk of the military airborne equipment purchased will be for transport and bomber types but special emphasis is being placed on development of lightweight equipment that can be used in fighters. Commercial transports will require dual installations of all airborne avionics equipment as a safety factor. In addition owners of executive transports and lightplane operators will be potential purchasers of various types of airborne avionic equipment developed for navigational purposes.

There are now six items of avionics equipment being procured for the airways program: very high frequency radio landing beam (ILS); search radar for traffic control; precision beam radar (GCA); VHF automatic direction finders; VHF omni-directional range; and approach control timers.

Two other items (distance measuring equipment and mechanical interlocks) are rapidly passing out of the development phase toward production and large scale procurement.

▶**CAA Breakdown**—Breakdown of the CAA airways program for fiscal 1950 indicates how the money currently appropriated for civilian avionics will be spent:

• **DME—$15,043,226** to buy 560 ground units of distance measuring equipment for installation at present sites of VHF omni-range stations and at the end of runways equipped with ILS. Estimated unit cost is $29,600 for those at ILS sites and $25,780 for those installed with omni-ranges.

In addition to the government-financed ground installations, the military, commercial airlines, and owners of large executive planes will spend millions on airborne DME equipment to use the ground facilities. Military and commercial transports are expected to be equipped with dual airborne DME as a safety factor.

VHF omni-range—Bulk of the funds for ground omni-range stations has already been appropriated prior to fiscal 1950, although procurement of the 409 planned stations is still under way. Biggest future field in omni-range sales lies in production of airborne receivers to use the ground stations. Virtually every manufacturer of airborne radio equipment is working on omni-range receivers and several transport type models are already on the market. In addition to dual installations for military and commercial transports, there is a market of unestimated scope for lightweight omni-receivers for lightplanes and small executive transports.

• **ILS—$4,294,000** to buy 38 additional ground installations; $349,848 to relocate ILS systems already installed and $1,723,746 to modernize other ILS systems now in operation. Many of the major airlines are now equipped with airborne ILS receivers but technical improvements indicate that most of the airborne units now in use will eventually be replaced with better cross-pointer indicators and a larger channel spread for glide path reception.

• **GCA—$2,340,000** to purchase 13 precision beam radar approach sets. No airborne equipment is required for using GCA except standard radio communications.

• **Traffic Control Radar—$4,332,000** to purchase 19 sets of search radar to give coverage of traffic in airport approach areas in all types of weather. Still in an experimental stage is an airborne radar beacon to be used with the ground radar stations for automatic plane identification and position reports.

• **Automatic VHF/DF—$601,392** for purchase of 44 sets to be installed in control towers at major air terminals. Only standard VHF radio communications are required for planes to use the VHF/DF facilities.

• **Approach Lights—$1,335,685** for 13 sets of high intensity approach lights.

• **Control Towers—$536,610** to be spent for establishment of 12 new airport traffic control towers.

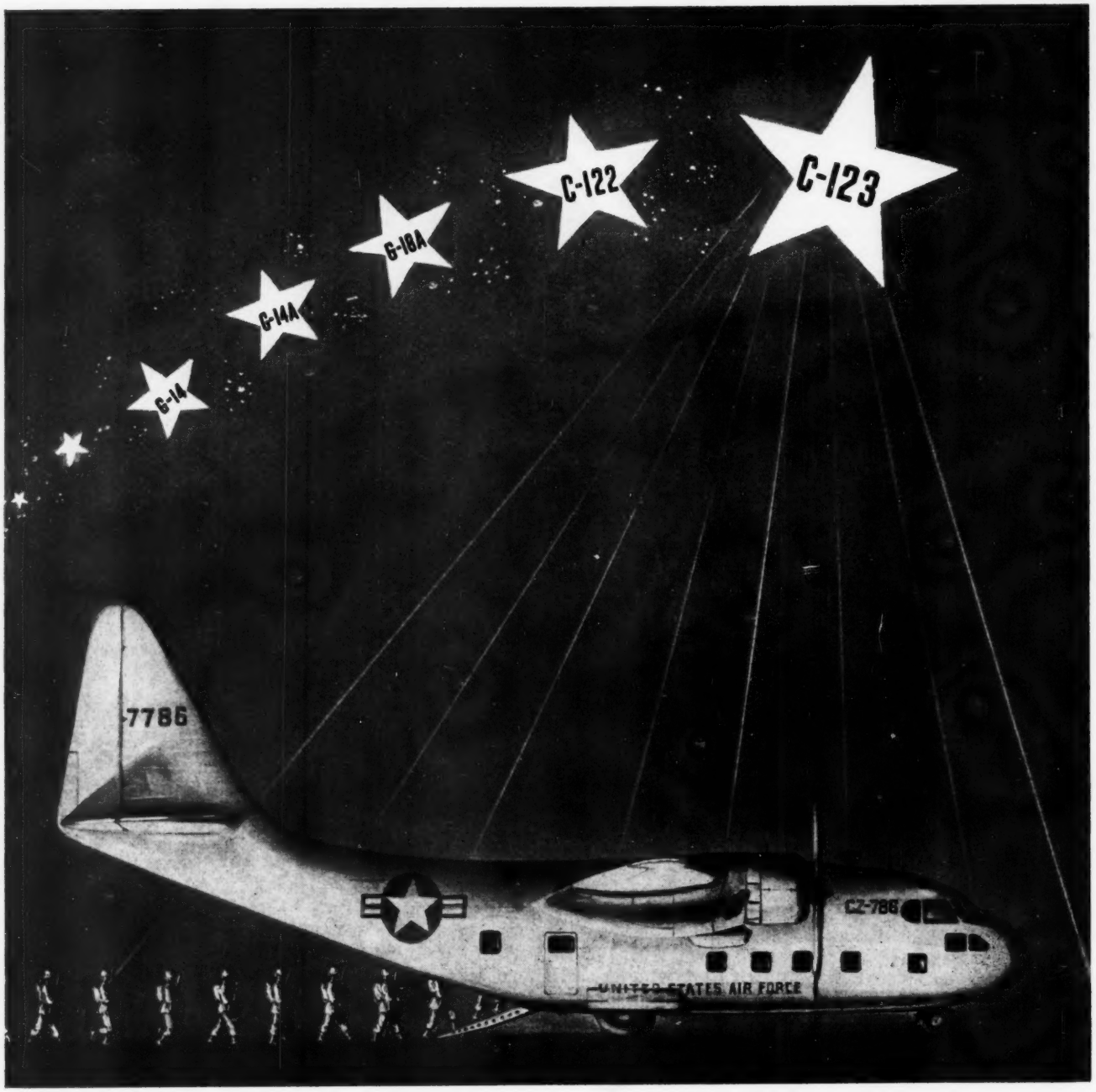
• **Approach Control—$495,000** for purchase of 15 airport approach control timing devices to be used in airport

reaching for the stars . . .

Almost beyond the imagination . . . yet well within the realm of possibility, lie the developments and ambitions of our modern aviation industry: Men and planes going faster than sound; aircraft for the exploration of the universe; hangars, airfields, navigation aids suspended in space — things beyond belief.

And as requirements for superplanes grow . . . SKF, in cooperative progress with the Aircraft Industry, will continue to design and manufacture ball and roller bearings to withstand the terrific temperatures and speeds these new developments demand. SKF Industries, Inc., Philadelphia 32, Pa. 6572

SKF



a New Star!

Again, Chase engineering has demonstrated its resourcefulness in answering the need for larger, more durable, more versatile transports. The **C-123** offers utility, versatility, ease and economy of operation on a grand scale. For, within the 77 ft. fuselage and 110 ft. span is a spacious cargo compartment capable of accommodating a 155mm Howitzer and truck, 60 fully equipped troops, 50 litter patients. Truly, Chase has placed a new star in the aircraft firmament.

Chase AIRCRAFT CO., Inc.

WEST TRENTON, NEW JERSEY

STROUKOFF AVITRUC

control towers to aid in scheduling a smooth flow of traffic onto the landing runway in bad weather conditions.

• **Mechanical Interlocks—$442,000** for purchase of 30 mechanical interlocks designed to coordinate air traffic control information between control centers and control towers at main air terminals.

Remainder of CAA's fiscal 1950 airways funds will be spent on communications equipment of various types.

► **USAF**—U. S. Air Force fiscal 1950 program for avionics procurement breaks down as follows:

• **Air Navigation Aids—$27,155,304.** This includes: $10,362,631 for GCA; $3,104,265 for traffic control radar; $1,045,308 for omni range ground stations; $1,532,000 for airborne omni-receivers; $609,000 for low frequency Loran; $9 million for weather communications equipment, X-band radar, control tower consoles and point-to-point communications equipment.

• **Radar Warning Net—$45,054,416.** This is the third installment in a six-year program to provide a new type radar early warning network and fighter control system for air defense of North America.

• **UHF Conversion—$22,931,424.** This is the second installment in a joint USAF-Navy program to shift military aircraft communications out of the very high frequency band where they now conflict with commercial aircraft frequencies into the ultra high frequencies. The UHF equipment will operate between 225 and 440 megacycles.

• **Identifications Systems—$10,229,884.** This is part of a joint USAF-Navy program to provide new identification techniques to distinguish friendly from enemy aircraft. It will include both ground and airborne equipment.

• **Command communications net—$7,192,752** This will provide another installment on the USAF program for establishing a global network of command communications.

• **Coding equipment—$2,436,220.** This is part of a six year program to replace World War II coding and decoding equipment with new type equipment offering better security.

More Use Planned For Field Offices

Steps to make the seven procurement field offices of the Air Materiel Command more useful to companies doing business with the Air Force are beginning to pay off in increased utilization of these offices by new and old contractors.

Using the same formula which has

(Continued on page 53)

90% OF JET AIRCRAFT MANUFACTURERS USE Refrasil HIGH TEMPERATURE, LIGHTWEIGHT, INSULATION

B-36 Largest Bomber
F-86 Fastest Record
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BOEING B-47
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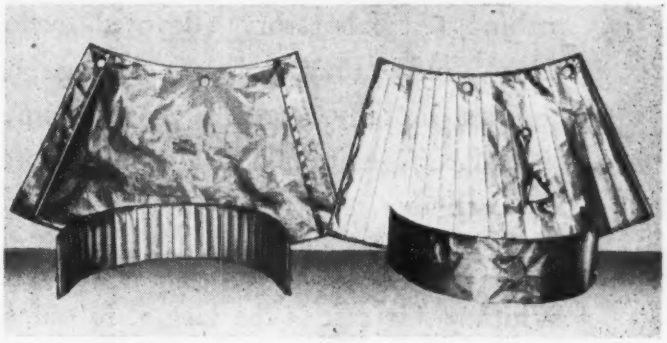
NORTH AMERICAN F-86, B-45
NORTHROP YB-49
DOUGLAS D-558-1, D-558-2, XF-3D



Typical conical blanket construction for tail cone of Jet Aircraft. Smaller narrow blanket as used on turbine case.

REFRASIL is high temperature, lightweight insulation. Withstands sustained temperatures up to 1800°F. and flashes up to 2400°F. Easy to install and remove. This hard to beat combination makes REFRASIL *FIRST* in the Jet Aircraft Insulation Field.

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WHAT'S DOING

Every working day at Pratt & Whitney Aircraft nearly 50,000 gallons of gasoline are consumed.

That's one way of saying that we do a lot of engine testing. But it doesn't begin to tell the complete story of Pratt & Whitney's test program. That program began in 1925, when we built our first Wasp engine. It has continued and expanded ever since. Twenty-four hours a day, six days a week (and often seven), scores of tests are being conducted on complete engines or component parts. And every test contributes something toward giving our customers better, more powerful, more dependable engines.

We believe that today Pratt & Whitney Aircraft has the finest engine test facilities in the world. These include such items as a multi-million dollar turbine test laboratory (devoted exclusively to testing turbine engine parts), more than a hundred large test houses for running completed engines, literally scores of smaller units for testing parts and accessories, special refrigeration and altitude laboratories, and our own fleet of flight test airplanes.

With these facilities in constant use, our current test program at Pratt & Whitney Aircraft is the largest in our history. Some idea of its scope can be gained from the brief outline on the next page.

Test facilities at Pratt & Whitney Aircraft include more than 200 installations, ranging from a simple test bench to full-scale test houses and a turbine test laboratory. They represent an investment of more than 20 million dollars.

Test personnel at Pratt & Whitney includes more than 1,000 employees — engineers, technicians, pilots, mechanics, clerks and many others. In a year they devote more than 2,000,000 man-hours to our test programs.

at Pratt & Whitney Aircraft?

COMPONENT TESTING

Testing of a new type of engine begins before the first model is assembled. This is "component testing" in which major parts such as cylinders, superchargers, compressors, turbines, burners and others are individually tested to see how they will perform in the finished engine. Then, when the parts are assembled, full-scale testing is less costly and less time-consuming, because many of the "bugs" have already been eliminated. Even after the engine is in regular production, component testing continues to be a mainstay of the development program. Whenever a new part is designed, whenever higher performance is sought, whenever operating troubles develop in service, a series of component tests help to solve the problems. In an average week, well over 100 tests are being conducted on various parts of Pratt & Whitney engines.

COMPLETE ENGINE TESTING

When the first experimental engine of a new type is assembled, a program of full-scale testing is begun to see how well the thousands of individual parts function as a unit. Then the engine must pass the gruelling 150-hour government type test, to be certificated. Here again this is only the beginning, and there is a continuous program of full-scale testing to improve the performance of the power plant under every possible operating condition. So extensive is this program that a battery of 35 full-size test houses are in almost constant use testing experimental reciprocating and turbine engines. Just as an example, nearly 50,000 hours of full-scale experimental testing have been done on the R-4360 Wasp Major type since the first engine was assembled. This does not include many additional thousands of hours of component testing and tens of thousands of hours of final testing of production engines.

FLIGHT TESTING

To supplement the component testing and full-scale testing, we carry on an extensive program of flight testing. We have our own airport, our own experimental hangar, a fleet of half a dozen flight test airplanes, and a flight test staff of pilots, engineers and technicians. Day after day this group puts our engines through the acid test of performance in actual flight.

SPECIAL TESTING

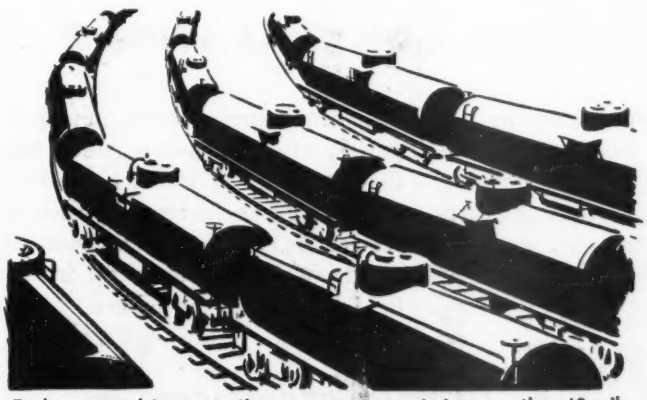
Still another phase of testing arises frequently. This special and somewhat-out-of-the-ordinary type of work is that which our engineers carry on outside our plants. To study icing conditions, several engineers will run tests during a bitter winter atop Mt. Washington in New Hampshire. Others may spend several months in one of our customer's plants working with their engineers on some special test. Still others may find themselves at some remote military base running special tests to lick a particular problem that has arisen there. All these tests help make our engines perform better under the unusual conditions often encountered in actual service.

PRODUCTION TESTING

All the testing referred to above relates primarily to the experimental development of new engine types. But even after they have passed their 150-hour type tests and gone into quantity production, they are subjected to further testing. Every reciprocating engine that rolls off the final assembly line goes through two basic tests. First is the so-called green test of about 5 hours to make sure that it is functioning properly. Then it is completely disassembled and visually inspected for indications of unusual wear or incipient troubles. Following this, it is reassembled and run on the test stand for another 3 or 4 hours to see that it measures up to performance guarantees before being shipped to the customer. Production models of our new turbine engines go through a similar test program. All told some 65 full-size test houses are kept busy on these production tests.

* * * *

Summed up, Pratt & Whitney's test program involves heavy expenditures of time, money and effort. But it is giving our customers better, more powerful, more "Dependable Engines".



Fuel consumed in our testing program amounts to more than 13 million gallons a year. This is the equivalent of 1,450 average tank cars — more than $2,500,000 worth of gasoline. For cooling purposes, 125,000 gallons of water per minute will go through the turbine test lab — six times the consumption of a city of 250,000 people.

PRATT & WHITNEY AIRCRAFT

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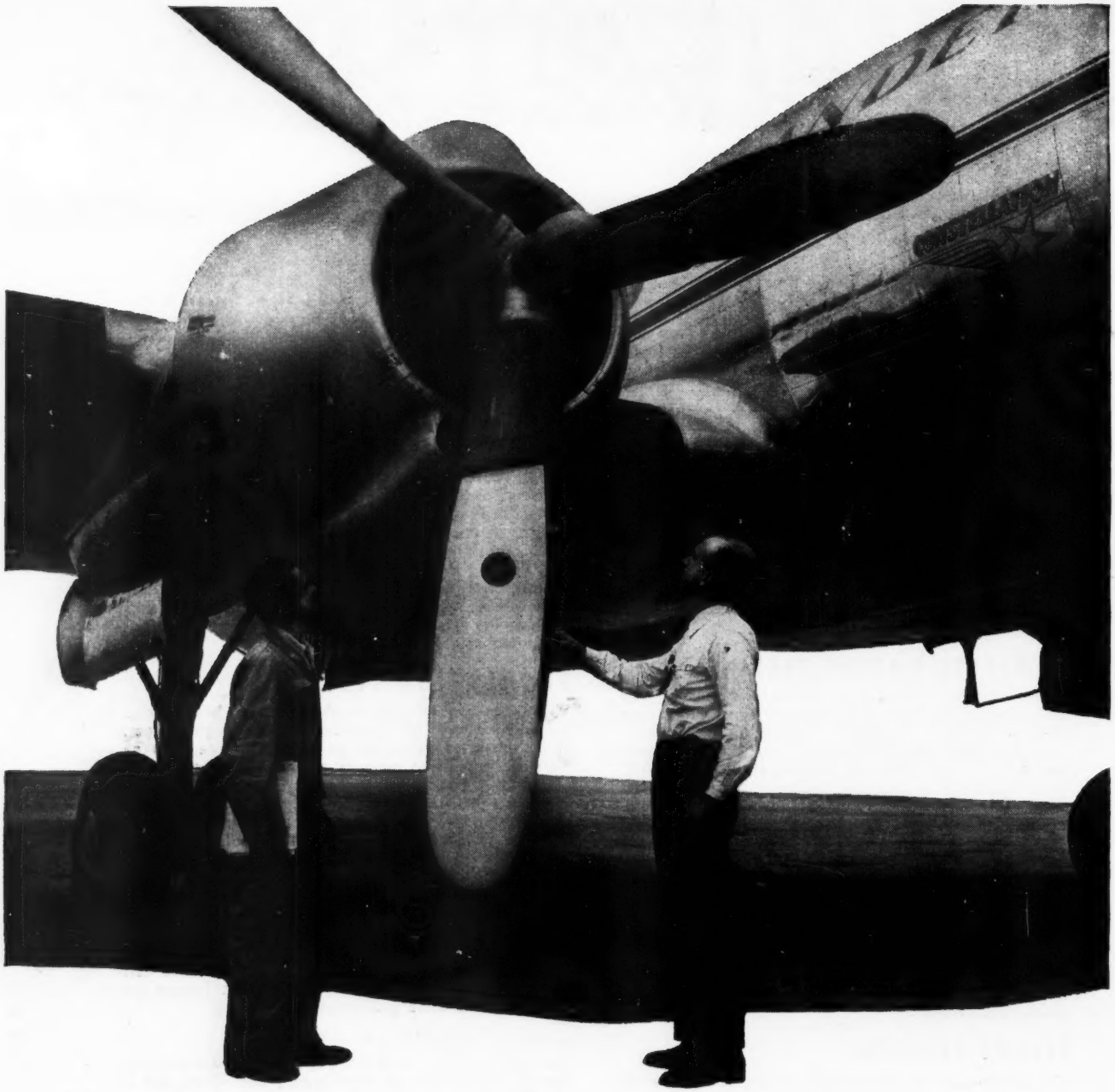
ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION



New Curtiss Propeller

FOR THE NEW L-749A CONSTELLATIONS

A new Curtiss propeller has been approved by the CAA for unrestricted operation on Lockheed L-749 and L-749A Constellations. This propeller's high solidity provides improved take-off, climb and cruise speed at higher gross weights, and its rugged construction assures long service life.

Other *service-proved* Curtiss features incorporated in this new propeller are . . . *reliable feathering* . . . *reverse thrust* for smooth, air-cushioned landings . . . *automatic synchronization* for passenger comfort and ease of control . . . durable *hollow-steel blades* for abrasion resistance.

The acceptance of this new propeller, after extensive stand and flight testing . . . under conditions surpassing the severest stresses of service use . . . is further evidence of Curtiss-Wright's leadership in the field of aircraft propellers.

CURTISS *ELECTRIC PROPELLERS*

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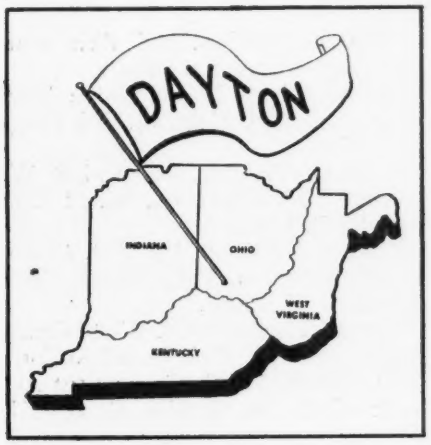
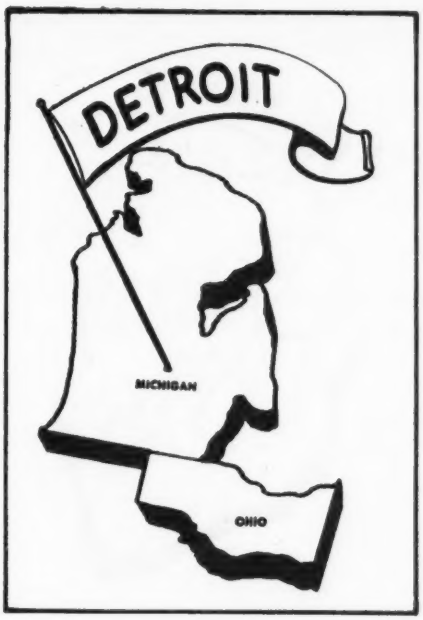
FIRST IN FLIGHT



worked out in the contractors' relations office at Wright Field's procurement division headquarters, AMC is encouraging field offices to provide roomy, well-lighted attractive quarters where contractors and their representatives can inspect invitations for bid and abstracts of contract awards, and get information about bid sets and on qualification as Air Force suppliers.

▶ **Contracts Doubled**—With the number of individual Air Force contracts handled by AMC doubled in the period between June 30, 1948 and June 30, 1949, and a sizable increase in the number of prime contractors and sub-



Perhaps you can't make out the address. It may be BuAer or the USAF. Or it may be your shipment---of a faired-in antenna for a new jet aircraft, a moving target indicator or video mapping unit for air traffic control radar.

Or perhaps the shipment may contain an engineering report on the analysis of a particular problem, consequent recommendations or development of equipment.

Whatever the shipment, wherever it goes, the AIL seal assures the latest techniques in electronic research, development and production.

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Approved under AN-F-8b for all U. S. Airforce planes

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SOME ASSIGNMENTS ARE EASY Swift, accurate answers to many problems are routine, because of our substantial background in the aircraft industry. The theoretical and empirical data we have developed over many years is called into action for your immediate benefit as soon as your inquiry is received.

SOME ARE DIFFICULT Our engineering departments are working constantly with advanced projects in the aircraft mechanical-power-transmission field. We can attack your current problem with knowledge that is *up-to-date.*

NO GEAR WE CAN'T CUT Pacific-Western manufacturing facilities are most unusual. We produce every known type of gear in our own plants, as well as special machined aircraft parts and shapes.

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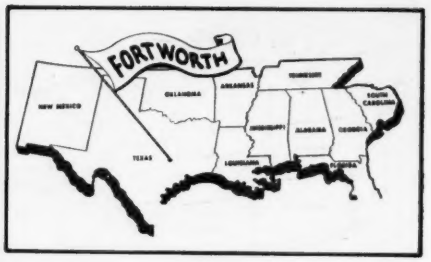

contractors, each of the field offices is carrying a proportionately heavier load than before.

The seven offices, and their commanding officers are as follows:

- **Boston,** Liberty 2-6000, Boston Army Base, Boston 10, Mass., Lt. Col. Philip J. Kuhl.
- **Chicago,** Webster 9-4384, 209 W. Jackson Blvd., Chicago 6, Ill., Lt. Col. Charles G. Esau.
- **Dayton,** Kenmore 7111, Ext. 65306, Wright-Patterson AFB, Dayton, Maj. Lawrence H. Prugh.
- **Detroit,** Hogarth 8730, West Warren and Longo Aves., Col. Russell Keillor.
- **Ft. Worth,** 72181, Government Aircraft Plant No. 4, Col. Beverly H. Warren.
- **Los Angeles,** Prospect 4711, 155 W. Washington Blvd., P. O. Box 3849, Terminal Annex, Brig. Gen. Thomas H. Chapman.
- **New York,** Whitehall 4-1600, 67 Broad St., Brig. Gen. Arthur Thomas.

Recently opened on the West Coast was an important new sub-field office at Oakland Municipal Airport near San Francisco, which serves Northern California and adjacent areas. It is under jurisdiction of the Los Angeles office.

In addition AMC maintains full time Air Force plant representative offices at the factories of several of its principal airframe and engine manufacturers.

A typical field office is a miniature

NOW ON FLEET DUTY!

In striking effectiveness and speed, the Douglas AD-*Skyraider* line of dive and attack bombers is meeting the highest requirements of national defense. The result of nearly two decades of attack development by Douglas, the *Skyraider*, like its predecessor the SBD *Dauntless*, is famed for top performance and dependability under all operating conditions. Today the *Skyraider* is in volume production at the El Segundo Plant of Douglas for the U. S. Navy.

DEPEND ON DOUGLAS

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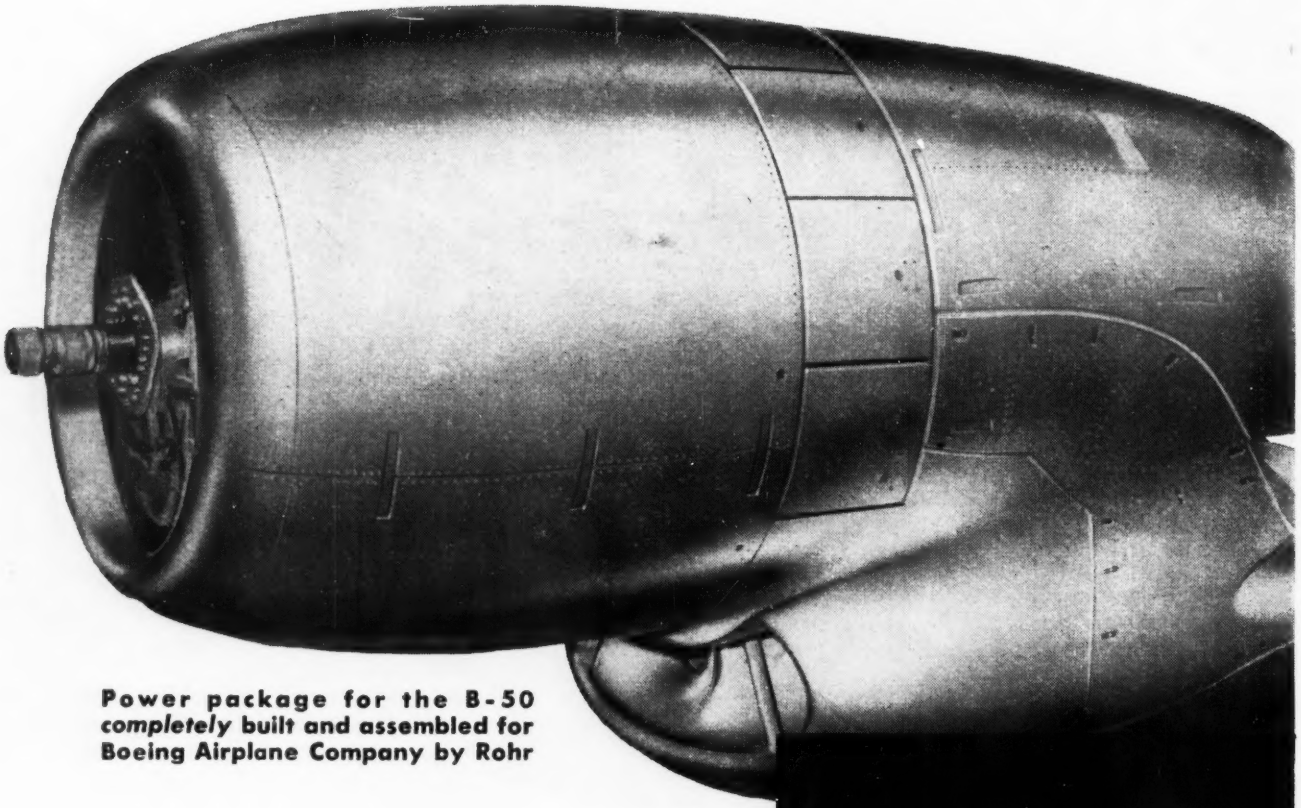

Power package for the B-50 *completely* built and assembled for Boeing Airplane Company by Rohr

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• AIRCRAFT SUBASSEMBLIES • SHEET METAL WORK TO SPECIFICATIONS • POWER PLANT HANDLING EQUIPMENT

AMC, organized to handle contracts, inspection, production and industrial planning, industrial property accounting, etc. Some of the offices, whose areas include some of the principal aircraft plants, maintain a flight operations branch which directs flight tests on new planes purchased or government planes that are reconditioned.

► **Office Services**—The aspirant to contractor status will save money by working with his regional field office instead of making too frequent trips to Dayton. At the field office he will find posted notices for invitations for bids, and contract awards and will find an industrial planning representative who will assist him in qualifying as a source of supply for USAF. At the field office he is permitted to inspect bid requirements in a complete bid kit for each contract so that he can determine if he wants to enter the competition on that particular item.

If he decides to compete, he is then instructed to write or wire for a bid kit of his own to Contracting Officer, AMC, Wright-Patterson AFB, Dayton, Ohio, Attention: MCPPSX72.

► **Contract Payments**—Contracting officers at the field offices supervise the carrying out of each contract to completion or termination, interpret contract clauses to manufacturers, and make payments. USAF pays its contractors in several ways depending on contract terms. In some fixed-price contracts payments can be made as often as several times a day. Payments are sometimes further complicated by the fact that the contractor may have several contracts active simultaneously, including prime contracts as well as subcontracts.

The field office does not often mix into the subcontracting business except to provide inspection on certain subcontracted items that are components of larger assemblies but which are sufficiently complicated in themselves to require inspection before delivery of the subcontracted article to the prime contractor's plant.

► **Half Are Inspectors**—Inspection is one of the biggest jobs of the field office, and approximately half of its employes are inspection personnel. The usual procedure is an interlocking arrangement with the manufacturer who is expected to supply most of the inspection in his own plant, subject to the AMC inspector's training, requirements, and spot-checking.

In the Los Angeles area, ratio of Air Force to company inspectors fluctuates from 1:18 to 1:20 after a plant inspection system has reached a satisfactory status.

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This service cuts purchasing time because one call to Ryerson, one order and one invoice quickly covers a whole group of steel requirements. Do you want one piece or a truckload? You get prompt, personal service either way. Do you want your steel sheared, sawed or slit—burned, bent, punched or threaded? You can be sure of getting quick accurate delivery from your nearby Ryerson plant. So call us next time you need steel from stock. We'll get it to you faster because we're coming your way every day.

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Every design engineer and production man interested in the many uses of hydraulic tubing will find Superior Bulletin #38 a useful, authoritative compilation of basic data.

Specific sections of the bulletin cover analyses, size ranges, lengths and tempers of Superior Hydraulic Tubing. Other sections give important facts on test procedures and the maximum working pressures of the tubing.

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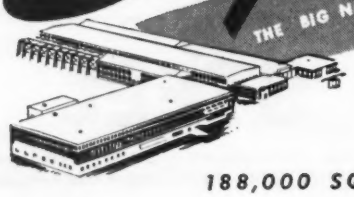

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Property Classes

United States Air Force keeps an accounting of its widely scattered physical properties by means of a numerical classification system not unlike the system used to classify books in public libraries.

While space does not permit listing of the complete classification listings here, the basic property classes are shown as a service to manufacturers interested in USAF procurement. Manufacturer should know the property class or classes in which his products are placed, and related classes.

USAF Property Classes:

- **Class 01:** Aircraft and aircraft parts. Complete aircraft are in sub-class 01-A, and complete aircraft for ground instruction purposes are in sub-class 01-Z, other subdivisions within this class denote aircraft parts.
- **Class 02:** Aircraft engines and engine parts. Complete aircraft engines are in Sub-Class 02-A. Auxiliary aircraft engines, such as jet assist takeoff units and auxiliary powerplants for electrical systems, are in Sub-Class 02-B. Other subdivisions within this class denote aircraft engine parts.
- **Class 03:** Aircraft and engine accessories and accessory parts. Widely varied "catch-all" class of special-purpose attachments and accessories. Sub-classes include: 03-A, propellers and parts; 0.3-D, wheels, brakes, skis, floats and parts; 03-C, aircraft carburetors and parts, 03-E, turbosuperchargers and parts; 03-F, miscellaneous aircraft accessories ranging from lifecrafts to lavatories to windshield wipers; 03-G, hydraulic struts and actuating cylinders; 03-H, aircraft ignition systems and parts; 03-I, aircraft fuel systems, hydraulic, vacuum, oil and de-icer systems and parts; 03-J, miscellaneous engine accessories including batteries, mounts, quadrants, etc.; 03-K, breathing oxygen equipment; 03-L, auxiliary fuel tanks; 03-M, transmissions for rotary-wing aircraft.
- **Class 04:** Aircraft hardware, rubber products, bearings.
- **Class 05:** Aircraft instruments, including navigation, flight, engine, and miscellaneous instruments and parts. This class also includes automatic pilots and gyro control mechanisms.
- **Class 06:** Fuels, lubricants and gases.
- **Class 07:** Dopes, paints, cleaning compounds, soaps, glue, wax, etc.
- **Class 08:** Commercial electrical equipment and supplies.
- **Class 09:** Aerial targets and gliders.
- **Class 10:** Photographic equipment and supplies.
- **Class 11:** Aircraft armament, including bombing equipment from bombsights to hoists and shackles, gunnery equipment, turrets and guided missiles.
- **Class 12:** Fuel and oil handling equipment.
- **Class 13:** Special-purpose clothing and personal equipment, including personnel-carrying parachutes, oxygen masks, flying suits, etc.
- **Class 14:** Sub-class 14B, pre-fabricated hangars and buildings.
- **Class 15:** One-time modification kits, for field changes in aircraft, engines, accessories, etc. (Continued, p. 61)

WILCOX ...First Choice for Transatlantic Airline Communication

The whirling propellers of the international air lines make daily mockery of the vast space of the Atlantic Ocean. Intercontinental passengers and cargo come and go hourly at New York, Miami, Gander; Shannon, Ireland, and Lisbon, Portugal. These European and American airports are equipped with modern long-range, multichannel WILCOX Transmitters.

Oslo, Norway, and Stockholm, Sweden, use WILCOX Transmitters as basic communications equipment, and radio beacon service is provided at Reykjavik, Iceland, by WILCOX Type 96-200 Transmitters.

Thus, the giant airliners of the world's major airways are protected in flight and guided safely to the runways of Europe's and America's principal ports of entry.

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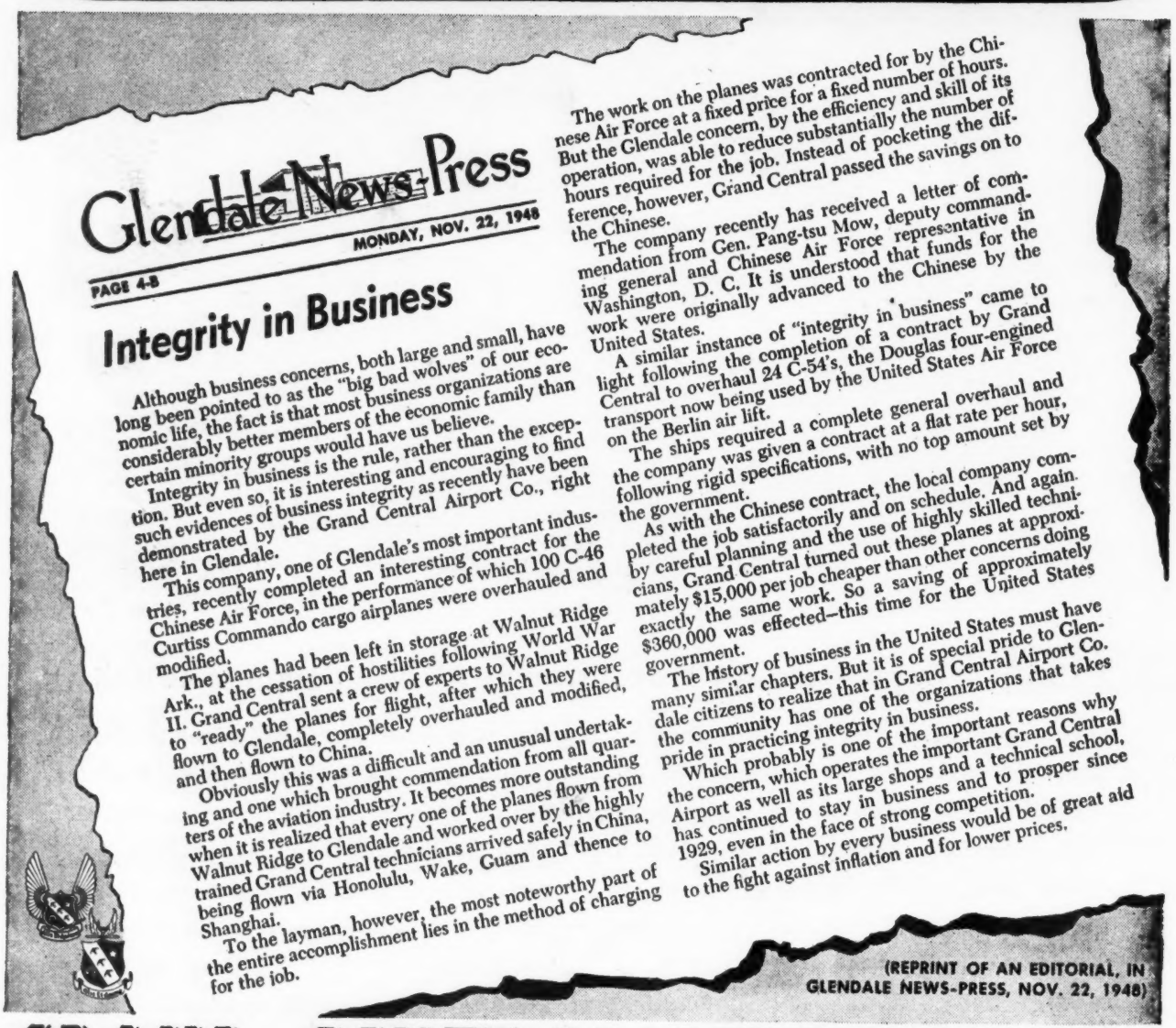

Glendale News-Press

MONDAY, NOV. 22, 1948

PAGE 4-B

Integrity in Business

Although business concerns, both large and small, have long been pointed to as the "big bad wolves" of our economic life, the fact is that most business organizations are considerably better members of the economic family than certain minority groups would have us believe.

Integrity in business is the rule, rather than the exception. But even so, it is interesting and encouraging to find such evidences of business integrity as recently have been demonstrated by the Grand Central Airport Co., right here in Glendale.

This company, one of Glendale's most important industries, recently completed an interesting contract for the Chinese Air Force, in the performance of which 100 C-46 Curtiss Commando cargo airplanes were overhauled and modified.

The planes had been left in storage at Walnut Ridge Ark., at the cessation of hostilities following World War II. Grand Central sent a crew of experts to Walnut Ridge to "ready" the planes for flight, after which they were flown to Glendale, completely overhauled and modified, and then flown to China.

Obviously this was a difficult and an unusual undertaking and one which brought commendation from all quarters of the aviation industry. It becomes more outstanding when it is realized that every one of the planes flown from Walnut Ridge to Glendale and worked over by the highly trained Grand Central technicians arrived safely in China, being flown via Honolulu, Wake, Guam and thence to Shanghai.

To the layman, however, the most noteworthy part of the entire accomplishment lies in the method of charging for the job.

The work on the planes was contracted for by the Chinese Air Force at a fixed price for a fixed number of hours. But the Glendale concern, by the efficiency and skill of its operation, was able to reduce substantially the number of hours required for the job. Instead of pocketing the difference, however, Grand Central passed the savings on to the Chinese.

The company recently has received a letter of commendation from Gen. Pang-tsu Mow, deputy commanding general and Chinese Air Force representative in Washington, D. C. It is understood that funds for the work were originally advanced to the Chinese by the United States.

A similar instance of "integrity in business" came to light following the completion of a contract by Grand Central to overhaul 24 C-54's, the Douglas four-engined transport now being used by the United States Air Force on the Berlin air lift.

The ships required a complete general overhaul and the company was given a contract at a flat rate per hour, following rigid specifications, with no top amount set by the government.

As with the Chinese contract, the local company completed the job satisfactorily and on schedule. And again by careful planning and the use of highly skilled technicians, Grand Central turned out these planes at approximately $15,000 per job cheaper than other concerns doing exactly the same work. So a saving of approximately $360,000 was effected—this time for the United States government.

The history of business in the United States must have many similar chapters. But it is of special pride to Glendale citizens to realize that in Grand Central Airport Co. the community has one of the organizations that takes pride in practicing integrity in business.

Which probably is one of the important reasons why the concern, which operates the important Grand Central Airport as well as its large shops and a technical school, has continued to stay in business and to prosper since 1929, even in the face of strong competition.

Similar action by every business would be of great aid to the fight against inflation and for lower prices.

(REPRINT OF AN EDITORIAL, IN GLENDALE NEWS-PRESS, NOV. 22, 1948)

GRAND CENTRAL AIRPORT CO.

C. C. MOSELEY, PRESIDENT AND CHAIRMAN OF THE BOARD

Specializing in Overhaul, Repair and Conversion of Airplanes and Engines . . . *and its subsidiary*

CAL-AERO TECHNICAL INSTITUTE

Specializing in training of Aeronautical Engineers and Master Aviation Mechanics

GLENDALE, *(Los Angeles County)* CALIFORNIA

- **Class 16:** Communications equipment, including airborne and ground radio and radar and parts.
- **Class 17:** Shops and warehouse machinery, tools and equipment, including powered tools, hand tools, and test and inspection apparatus.
- **Class 18:** Special tools, calibrating equipment, dies, jigs, fixtures.
- **Class 19:** Flying field and hangar equipment, vehicles, crash boats, etc.
- **Class 20:** Aerial delivery equipment and protective covers.
- **Class 21:** Cordage, leather, fabrics.
- **Class 22:** Bulk lumber, cork, plywood, veneer.
- **Class 23:** Bulk metals and composition materials, including sheet, tubing, extrusions, non-electric wire, fiber, glass, plastics.
- **Class 24:** Chemicals.
- **Class 25:** Office equipment and supplies.
- **Class 26:** Ground school equipment.
- **Class 27:** Excess and surplus property.
- **Class 28:** Instructional equipment and training aids.
- **Class 29:** Hardware and miscellaneous supplies.
- **Class 30:** Publications, drawings, blank forms, training films.
- **Class 31:** Foreign aircraft, related equipment and material.
- **Class 32:** Aircraft and equipment for museum or historical purposes.
- **Class 99:** Miscellaneous items and equipment—printing presses, refrigerators, stoves, gym equipment, chaplain's supplies, mowers, boilers, trays, dental, medical and optical supplies.

Liaison Offices To Help Vendors

A new list of government officials to assist small business in obtaining military procurement contracts has been released by the Munitions Board Office of Procurement methods.

These are the small business liaison officers for Air Force and Navy procurement:

Department of the Navy

- Director, Office of Naval Material, Small Business Liaison Office, Room 2005—Main Navy Bldg., Washington, D. C., Capt. D. T. Giles, USN.
- Chief, Bureau of Aeronautics, Small Business Liaison Office, Room 2W 06, Bldg. W, Main Navy Ext., Washington, D. C., Mr. W. F. Romig.
- Chief, Office of Naval Material, Small Business Liaison Office, Room 2005 Main Navy Bldg., Washington, D. C., Cmdr. H. A. Fravel, USN.
- Aviation Supply Officer, Aviation Supply Office, Small Business Liaison Office, Oxford Ave. & Martin's Mill Rd., Philadelphia 11, Pa., Lt. H. E. Beckmeyer.
- Officer-in-Charge, Navy Purchasing Office, Small Business Liaison Office, 111 East 16th Street, New York 3, New York, Lt. Margaret R. Cunningham.

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Free—Technical Manual

Send for Kester's new 28-page manual, "SOLDER and Soldering Technique" . . . a complete analysis of the application and properties of soft solder alloys and soldering fluxes.

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KESTER SOLDER

DARNELL CASTERS & WHEELS

Extra Value

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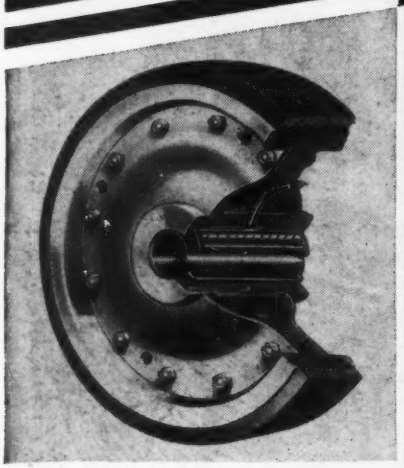

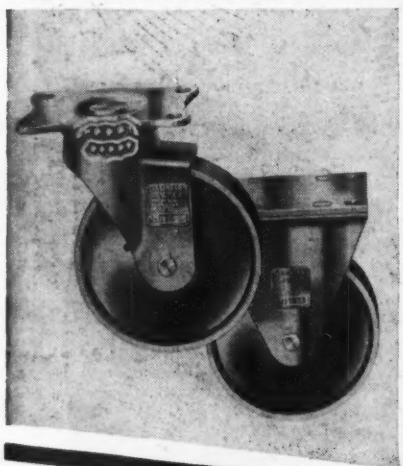

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Free Manual

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36 N. Clinton, Chicago 6, Ill.

• Commander, U. S. Naval Air Material Center, Small Business Liaison Office, Naval Base, Philadelphia 12, Pa., Lt. Cmdr. E. F. Dane, USNR, Lt. Cmdr. John L. Ruhl.

• Officer-in-Charge, Naval Purchasing Office, Small Business Liaison Office, Norfolk, Va., Lt. (jg) W. L. Lewis, USN.

• Supply Officer, U. S. Naval Air Station, Small Business Liaison Office, Pensacola, Fla., Ens. J. A. Donnelly.

• Supply Officer, U. S. Naval Air Station, Small Business Liaison Office, Miami, Fla., Cmdr. M. W. Blackstone.

• Supply Officer, Naval Air Auxiliary Station, Small Business Liaison Office, Corry Field, Pensacola, Fla., Lt. (jg) C. C. McCall.

• Supply Officer, U. S. Naval Air Station, Small Business Liaison Office, Corpus Christi, Tex., Ens. R. G. Bigham.

• Supply Officer, U. S. Naval Station, New Orleans, Small Business Liaison Office, Algiers 14, La., Cmdr. R. G. Linson, Lt. Cmdr. H. R. McArdle.

• Supply Officer, U. S. Naval Air Station, Small Business Liaison Office, Jacksonville, Fla., Lt. B. B. West.

• Commanding Officer, U. S. Naval Air Station, Small Business Liaison Office, Memphis, Tenn., Lt. Cmdr. J. W. McClure.

• Supply Officer, U. S. Naval Air Station, Small Business Liaison Office, Dallas, Tex., Lt. (jg) J. L. Elwood.

• Officer-in-Charge, U. S. Naval Purchasing Office, Small Business Liaison Office, 844 N. Rush St., Chicago 11, Ill. Cmdr. J. B. Robertson, Lt. Cmdr. G. L. Griffin.

• Officer-in-Charge, U. S. Navy Purchasing Office, Small Business Liaison Office, 180 New Montgomery St., San Francisco 5, Calif., Lt. Cmdr. A. D. McRae.

• Supply Officer, U. S. Naval Air Station, Small Business Liaison Office, Patuxent River, Md., Lt. S. Skirka.

• Electronics Supply Officer, Electronic Supply Office, Small Business Liaison Office, U. S. Navy, Great Lakes, Ill., Lt. Cmdr. C. W. Eskey.

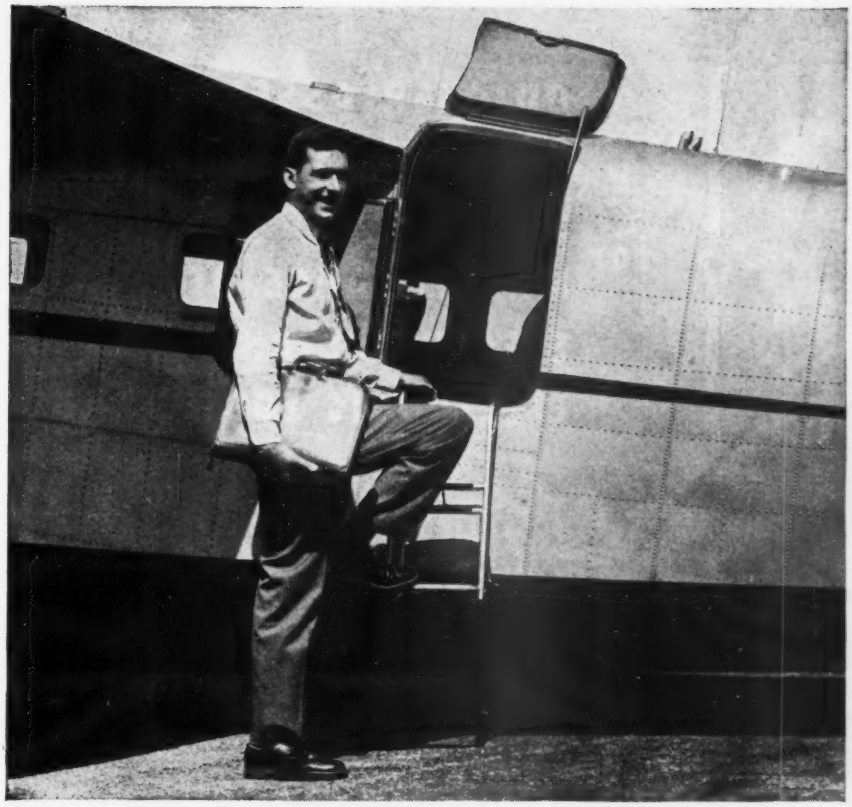
• Officer-in-Charge, U. S. Navy Purchasing Office, Small Business Liaison Office, 1206 S. Santee St., Los Angeles 15, Calif., Lt. J. J. Shelton.

• Supply Officer in charge, U. S. Naval Supply Depot, Small Business Liaison Office, Seattle 99, Wash., Lt. J. E. Moeller.

• Commanding Officer, U. S. Ordnance Laboratory, Small Business Liaison Office, White Oak, Md., Lt. Cmdr. T. E. Foster, Jr.

• Officer-in-Charge, U. S. Navy Purchasing Office, Small Business Liaison Office, Main Navy Bldg., Washington 25, D. C., Lt. W. M. Lohse.

• Supply Officer, U. S. Naval Research



"...best in the field"

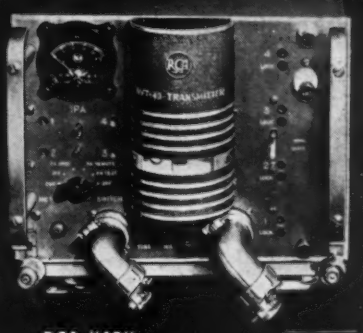
—says Chief Pilot John Stam, of NORTH CAROLINA PULP CO., about

RCA'S PAIR OF CHAMPIONS

With two years of installation-proved performance behind them, RCA's "49" Transmitter and "22" Receiver are providing dependable air-to-ground communication between the pulp mill in Plymouth, N. C. and the home office in Camden, N. J.,—as well as the 24 widely separated plants of the parent company (Kiekhefer Container Corp.). These units enable the pilot to get weather data promptly at any time while aloft—provide rapid, trouble-free communications with airport towers and range stations.

Says Chief Pilot Stam, "For consistently reliable communication, I rate the RCA '49' and '22' best in the field. I like the saving in space and weight they give me. And I like the fact that they don't require much battery current. During one flight, when my generator failed, I maintained normal communication for several hours by operating the radio off the plane's battery until I landed."

Engineered specifically to airline standards, the RCA "49" and "22" have passed the type tests for CAA certification. Call your RCA distributor for complete data. Or write Dept. 9I, RCA Engineering Products, Camden, N. J.



RCA "49" TRANSMITTER

- 50 watts output, voice or cw
- Automatic band-change
- 4 independent frequencies
- Completely self-contained
- Weighs only 42½ pounds
- Fits any standard airline rack
- Available for 12- or 24-volt operation
- Complete remote control

RCA "22" RECEIVER

- Continuous tuning over weather and range, standard broadcast, and aircraft communication bands
- Instant switching to either of four crystal-controlled frequencies between 2.83 to 13 Mc—plus airport tower frequency
- Can be used for accurate homing and position-finding with any RCA loop antenna
- Provision for interphone and sidetone transmission
- Weighs only 21 pounds
- Fits any standard airline rack
- Available for 12- or 24-volt operation
- Complete remote control

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NO OTHER manufacturer of electric connectors offers as many varied and diversified type series of quality electric connectors as Cannon Electric . . .

No other manufacturer of electric connectors has designed, engineered and built as many different special connectors for special applications . . .

Connectors for aircraft, radio, radar, guided missiles, microphones, power, instruments, controls, television, public address systems, geophysical equipment, telephone, industrial controls, and general electrical and electronic applications.

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Department of the Air Force

- The Commanding General, Air Materiel Command, Small Business Liaison Officer, Wright-Patterson Air Force Base, Dayton, Ohio, Mr. B. C. Dempsey.
- Director of Procurement and Industrial Planning Office, DCS/M, Small Business Liaison Officer, National Defense Building, Washington 25, D. C., Col. John G. Salsman.
- Chief, Chicago USAF Procurement Field Office, Small Business Liaison Office, 209 W. Jackson Blvd., Chicago 6, Ill., Mr. John V. Colwell.
- Chief, Los Angeles USAF Procurement Field Office, Small Business Liaison Office, P. O. Box 3849, W. Washington Blvd., Los Angeles, Calif., Mr. D. F. Marshall.
- Chief, Detroit USAF Procurement Field Office, Small Business Liaison Officer, West Warren & Lonyo Avenues, Detroit 32, Mich., Mr. Paul R. Acton.
- Chief, Fort Worth USAF Procurement Field Office, Small Business Liaison Office, Government Aircraft Plant No. 4, Fort Worth 1, Tex., Mr. Rush Gibbs.
- Chief, Dayton USAF Procurement Field Office, Small Business Liaison Office, Wright-Patterson Air Force Base, Dayton, Ohio, Mr. Herbert E. Tettman.
- Chief, New York USAF Procurement Field Office, Small Business Liaison Office, 67 Broad St., New York 4, N. Y., Mr. Philip Sosin.
- Chief, Boston USAF Procurement Field Office, Small Business Liaison Office, Boston Army Base, Boston 10, Mass., Mr. Faustine C. DePersio.

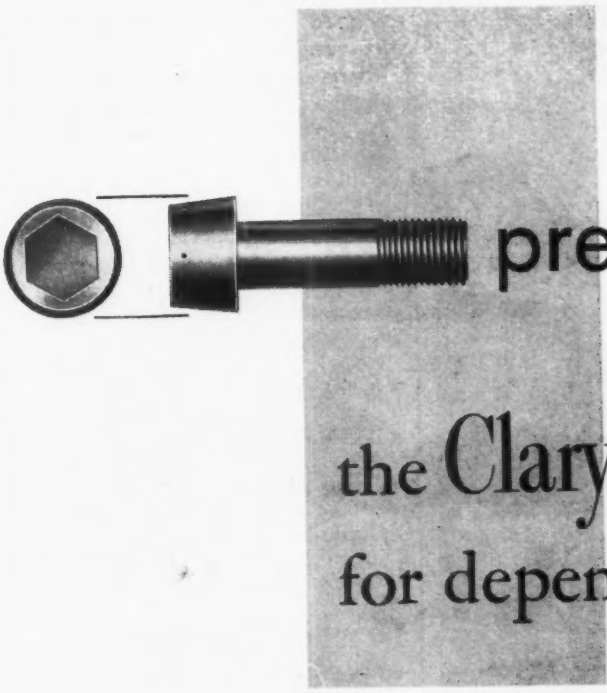
Industry Sales

Convair, Boeing lead in jump over half of '48. Sales of 8 firms down.

The aircraft industry's sales for the first six months of this year were up $183 million over the same period last year, primarily due to major boosts in the volume of Consolidated Vultee Aircraft Corp. and Boeing Airplane Co.

Sales of 18 manufacturers totalling $673,773,000 for the first half of this year compared with $490,485,000 for the comparable 1948 period.

Convair's sales skyrocketed from $16,193,000 for the first half of 1948 to $104,352,000 for the first half of this year. Boeing's sales boomed from $37,063,000 for the first half of 1948



A New Internal Wrenching—
High Tensile Strength Bolt . . .
manufactured with Clary's accuracy
for every detail:

hot forged
precision ground
threads rolled *after* heat treat
strippable plastic thread and shank protection
100% tested to current specifications in Clary's own laboratory.

For information on any fastener problems . . . write, wire or phone

Clary
MULTIPLIER CORPORATION
AIRCRAFT HARDWARE DIVISION

serving the aircraft industry since 1941

425 E. 54th St., Los Angeles 11, Calif. • Telephone CEntury 2-9221 • Cable Address: CLARYMULT

MINIMUM PROTRUSION

HI-SHEAR rivets have the smallest "headed ends" of any high strength fastener.

ELIMINATE MACHINING

HI-SHEAR collars mould to a rough or sloped surface, eliminating spotfacing and tapered shims.

STANDARD EQUIPMENT

HI-SHEAR riveting is accomplished with standard rivet guns and squeezers . . . no tool change delay . . . no expensive pullers or single purpose equipment.

U. S. and foreign patents—Trademark registered

PHEOLL MANUFACTURING COMPANY
5700 ROOSEVELT ROAD
CHICAGO 50, ILLINOIS
THE hi-shear RIVET TOOL CO.
1559 SEPULVEDA BOULEVARD
HERMOSA BEACH, CALIF.

to $110,634,000 for the first half of this year.

Sales of eight manufacturers were down: Beech Aircraft Corp.; Bell Aircraft Corp.; Cessna Aircraft Co.; Fairchild Engine and Airplane Corp.; Lockheed Aircraft Corp.; Glenn L. Martin Co.; Republic Aviation Corp., and United Aircraft Corp.

Sales totals for the first six months of this year (with totals for the first six months of 1948 in parenthesis):

- **Beech Aircraft Corp.,** $9,834,000 ($11,723,000)
- **Bell Aircraft Corp.,** $5,490,000 ($8,304,000)
- **Bellanca Aircraft Corp.,** $256,000 ($146,000)
- **Cessna Aircraft Co.,** $7,657,000 ($7,919,000)
- **Curtiss-Wright Corp.,** $59,243,000 ($51,894,000)
- **Douglas Aircraft Co.,** $52,254,000 ($42,921,000)
- **Fairchild Engine and Airplane Corp.,** $15,796,000 ($17,059,000)
- **Grumman Aircraft Engineering Corp.,** $14,640,000 ($14,640,000)
- **Lockheed Aircraft Corp.,** $55,798,000 ($65,981,000)
- **Glenn L. Martin Co.,** $23,033,000 ($26,689,000)
- **North American Aviation,** $67,372,000 ($34,561,000)
- **Northrop Aircraft** $13,479,000 ($13,472,000)
- **Piper Aircraft Corp.,** $2,139,000 ($1,833,000)
- **Republic Aviation Corp.,** $17,779,000 ($27,138,000)
- **Ryan Aeronautical Co.,** $7,514,000 ($3,410,000)
- **United Aircraft Corp.,** $106,503,000 ($109,539,000)

Source Inspection For Screw Products

USAF source inspection is being put into effect at six plants manufacturing screw products, such as bolts, nuts, screws, cotters, etc., in a new program to facilitate maintaining a constant quality control on aircraft materials whether manufactured on government contracts or not.

Until this program was initiated a manufacturer of these products could get Air Force inspection only on items produced under a specific government contract. The new plan provides for assignment of resident inspectors who will inspect all screw products under quality control procedures.

▶ **Quality Standard**—Result will eliminate a double standard of quality between USAF-approved items, and the virtually identical and interchangeable items which the manufacturer produced heretofore without an inspection by the Air Force.

Distributors of these manufacturers will benefit from this arrangement in that they will be permitted to carry stocks of USAF-inspected and approved units and will have them available for manufacturers requiring USAF inspection.

Packages will be received by the distributor sealed with Air Force approval stamp. The distributor is thus relieved of the necessity of furnishing affidavits concerning the products and submitting samples for inspection to USAF contractors who are his customers.

Navy Bureau of Aeronautics is understood to have agreed to accept the Air Force inspection and approval on the screw products.

All Distressed Areas Get Bid Invitations

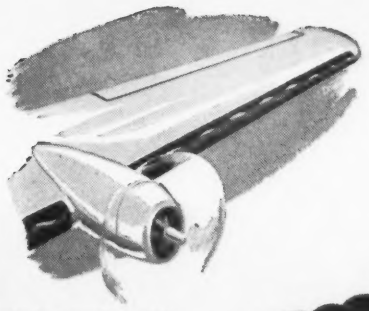
Additional sources of supply for USAF and Navy equipment and materials are expected to be provided by a new method of publicizing bid invitations in localities where unemployment is heavy.

USAF took the lead in this new program, following a directive from Defense Secretary Louis Johnson, relaying a memorandum from President Truman, asking that all departments channel and time their programs with a view to assisting these areas.

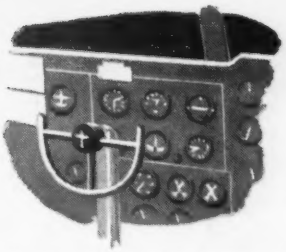
Air Materiel Command had previously set up machinery for listing its invitations for bid in response to a request from AVIATION WEEK that these be supplied for weekly publication. Additional requests from other publications resulted in broadening the distribution from AMC. Result was that AMC was ready immediately on the President's request to send out listings of invitations for bid to postmasters, for bulletin board display in communities classified as "unemployment areas."

Subsequently the Navy and Army Departments were asked by the Munitions Board to supply similar lists to the postmasters in the distressed areas, and were furnished samples of AMC listings as a guide in preparation of their own material.

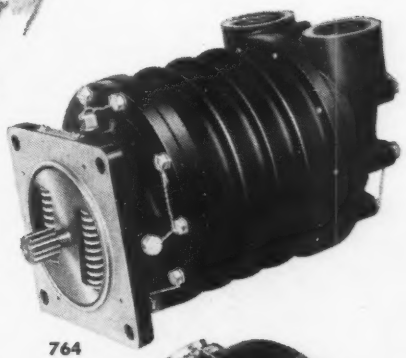
Manufacturers in these so called distressed areas will have a special incentive to bid on government contracts as a result of a policy established by the Munitions Board and approved by Comptroller General Lindsay Warren, that in the event of equal low bids a bidder in a "distressed" area shall be given preference over another bidder, so that contracts will be channelled into these areas whenever it is not prejudicial to the government.



Pressure for de-icer equipment?



Vacuum for air driven instruments?



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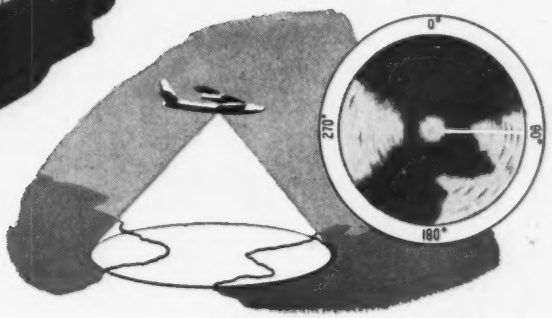
Vacuum for aerial camera installations?

1511



Pressurization for airborne radar systems?

AIR PUMPS
Engine Control Equipment
Engine Starting Equipment
Hydraulic Equipment
Ice Elimination Equipment
Power Supply Generating Equipment
Power Supply Regulating Equipment

★

Automatic Pilots
Flight Path Control Systems
Engine Instruments
Flight Instruments
Navigation Instruments

What are *YOUR* Air Pump Requirements?

Do your plans call for dry air, remote location, light weight and compactness? If they do, the Eclipse 1511 Dry Air Pump is the perfect answer. Operating on its own sealed-bearing power source and functioning smoothly with *no* lubrication in the pump chamber, it is the ideal source of *dry* air for pressurization of airborne radar systems or vacuum for aerial camera installations. For general use, such as the activation of de-icer boots and air driven instruments, choose the performance-proven Eclipse 764 Engine Driven Air Pump. But, whatever your needs, you can always be sure of real dependability by specifying Eclipse.

ECLIPSE-PIONEER DIVISION OF
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Bendix
AVIATION CORPORATION

LOOK FOR THE ECLIPSE MARK OF QUALITY

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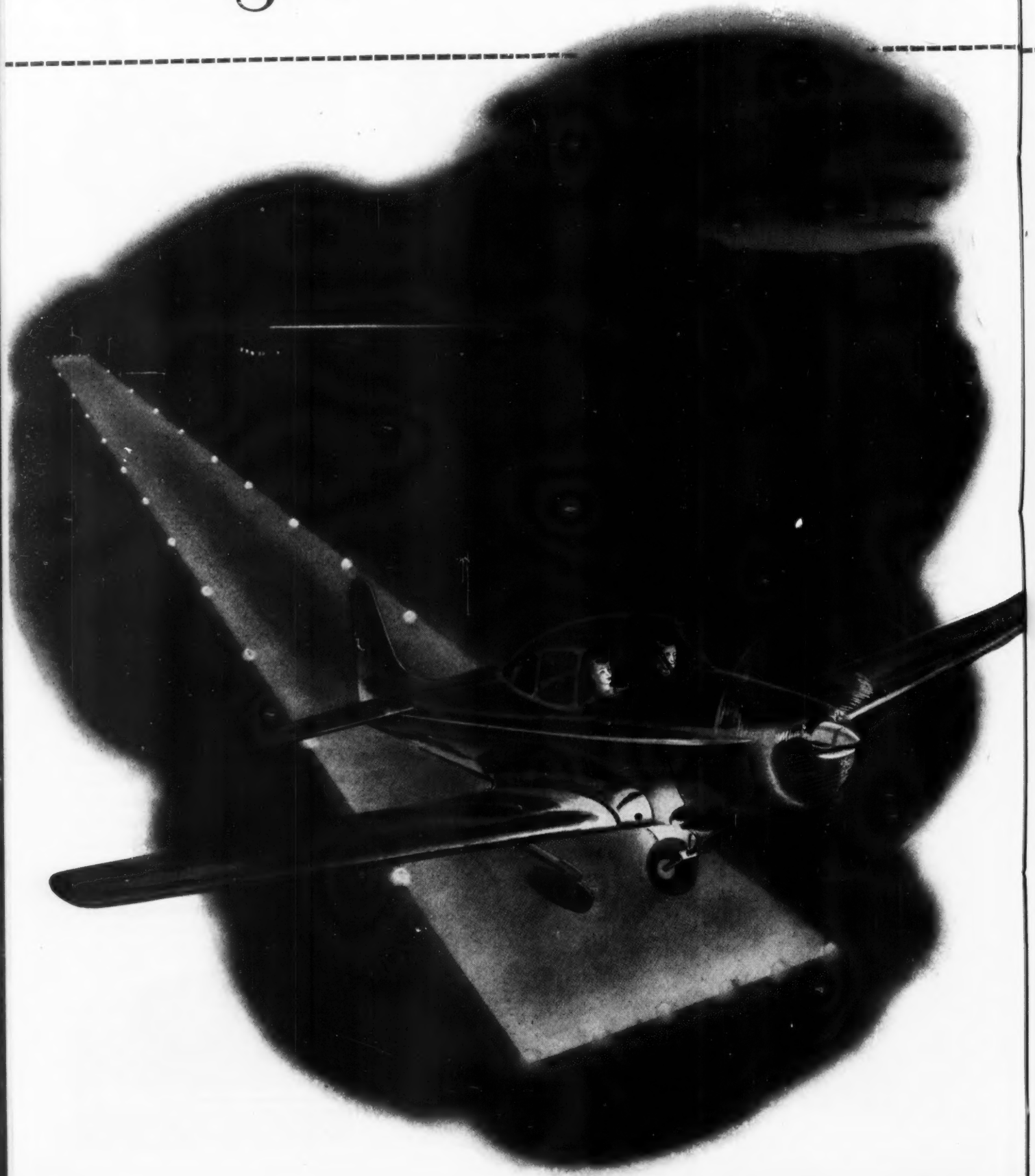
YOU CAN BE **SURE**.. IF IT'S

Westinghouse



EXPERIENCE

is the best teacher in Airport Lighting, too!!

Whether you're lighting an all-weather port, or a one-strip field, it pays to turn to Westinghouse . . . a single source of supply for co-ordinated lighting, distribution and controls.

Having built a rich background of airport lighting experience that dates back to 1927, Westinghouse leads today with the largest line of CAA-approved lighting equipment . . . more than 60 units that meet, or exceed, CAA standards.

Westinghouse Lighting Equipment for airports includes a "Junior" line, with quality and performance at the same high standards as the larger parallel types.

For further information, get your copy of Booklet B3573A, "Large Airport Lighting and Distribution", and Booklet B3968A, "Elevated Marker Light". Check the complete line of Westinghouse Aviation Equipment. Call your local Westinghouse representative or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-94820

TWO MORE "FIRSTS" FOR WESTINGHOUSE

Lights to penetrate heaviest fog. Designed and developed by Westinghouse, Krypton Flashing Beacon Lights are now in service at both European and American airports. Flashing 40 times per minute, these lights pierce dense fog at least 1,000 feet. Intensity is adjustable for clear or light foggy nights.

Sure transformer operation. Westinghouse-developed, the "CSP" (Completely Self-Protecting) transformer protects itself against lightning, short circuits and overloads. Universally accepted as best for airport distribution circuits.

Westinghouse

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We'll machine it for you . . .

TO *Aircraft* TOLERANCES

OUR experience, here at Non-Gran, on production runs of parts machined to .0005" in any metal, and in bronze castings, stems from 40 years successful manufacturing. We now serve many leading aircraft companies. They have found our services profitable. You may also! When you have work that is hard to do economically—or just hard work—give it to Non-Gran.

Write for booklet showing "Our Story in Pictures."

American NON-GRAN *Bronze Company*

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Leach relays of tomorrow...

IN DESIGNS OF TODAY!

LEACH RELAY COMPANY has been in business for over 30 years designing, modifying and developing thousands of types of relays for thousands of applications. Leading civilian and military aircraft manufacturers *specify* LEACH RELAYS as standard equipment. These include AN, AAF and NAF types; also included are AAF approved substitutes for AN relays. New designs and modifications are in a constant stage of development for specific requirements.

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Representatives in Principal Cities of U. S. and Canada

Local Buying

Manufacturers seeking small procurement contracts let locally by individual military installations should advise the commanding officer or the contracting officer at the bases listed below, stating the particular items they can supply.

Invitations to bid, and the procedure to receive these invitations, works much the same as it does at Air Materiel Command headquarters and Bureau of Aeronautics headquarters.

These installations make local purchases:

Air Materiel Command

Wright-Patterson Air Force Base
Procurement Division
Dayton, Ohio
(Procurement)

Air Force Technical Base
Wright-Patterson Air Force Base
Dayton, Ohio
(Development Center)

Middletown Air Materiel Area
Olmsted Air Force Base
Middletown, Pa.

Oklahoma City Air Materiel Area
Tinker Air Force Base
Oklahoma City, Okla.

Ogden Air Materiel Area
Hill Air Force Base
Ogden, Utah

Mobile Air Materiel Area
Brookley Air Force Base
Mobile, Ala.

Sacramento Air Materiel Area
McClellan Air Force Base
Sacramento, Calif.

Warner Robins Air Materiel Area
Robins Air Force Base
Warner Robins, Ga.

San Antonio Air Materiel Area
Kelley Air Force Base
San Antonio, Tex.

Holloman Air Force Base
Alamogordo, New Mex.
(Guided Missiles)

Kirtland Air Force Base
Albuquerque, New Mex.
(Airways Communication)

Muroc Air Force Base
Muroc, Calif.
(Flight Testing)

Clinton County Air Force Base
Wilmington, Ohio
(All-Weather Center)

Griffiss Air Force Base
Rome, N. Y.
(Electronics)

Pyote Air Force Base
Pyote, Tex.
(Aircraft Storage)

San Bernardino Air Force Base
San Bernardino, Calif.
(Storage & Issue)

832nd AF Specialized Depot
Topeka, Kans.

830th AF Specialized Depot
Memphis, Tenn.

THEY'RE STRATOS-FIED

Boeing's B-47 STRATOJET

Installations in

LOCKHEED · BOEING · MARTIN U.S.A. · Grumman · PAA · McDONNELL Aircraft Corporation · CURTISS WRIGHT · NAA

Day by day and flight by flight, the advantages of Stratos cabin pressuring and air conditioning installations are being proved—proved in military and commercial planes, fighters and bombers; jet and propeller-powered aircraft and in overseas passenger transports.

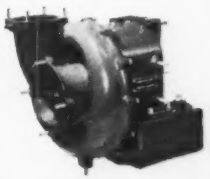
In them, Stratos equipment provides cabin pressurization and air conditioning so vital to Military operations, so essential to airline operating economy and passenger comfort. Rapidly varying conditions of altitude, solar radiation and frictional heat resulting from high speed present complex problems, solved only by precise engineering methods.

Stratos advantages have been achieved through the highest standards of design ingenuity, precision manufacturing techniques plus knowledge and experience—experience dating from the days when engine supercharging was in its infancy.

STRATOS Has These ADVANTAGES

Superchargers can be engine-mounted, take power directly from reciprocating engines.

Hydraulic coupling maintains constant air flow to the cabin independent of engine speed and altitude.



Light weight — the Banshee air conditioning unit weighs 14 pounds, the Constellation's less than 58.

Compactness. Dependability. Easy maintenance. Highest standards of performance.

Stratos Engineers will answer your inquiries Write to

STRATOS CORPORATION

Farmingdale, N. Y., or
1307 Westwood Boulevard, Los Angeles 24, California

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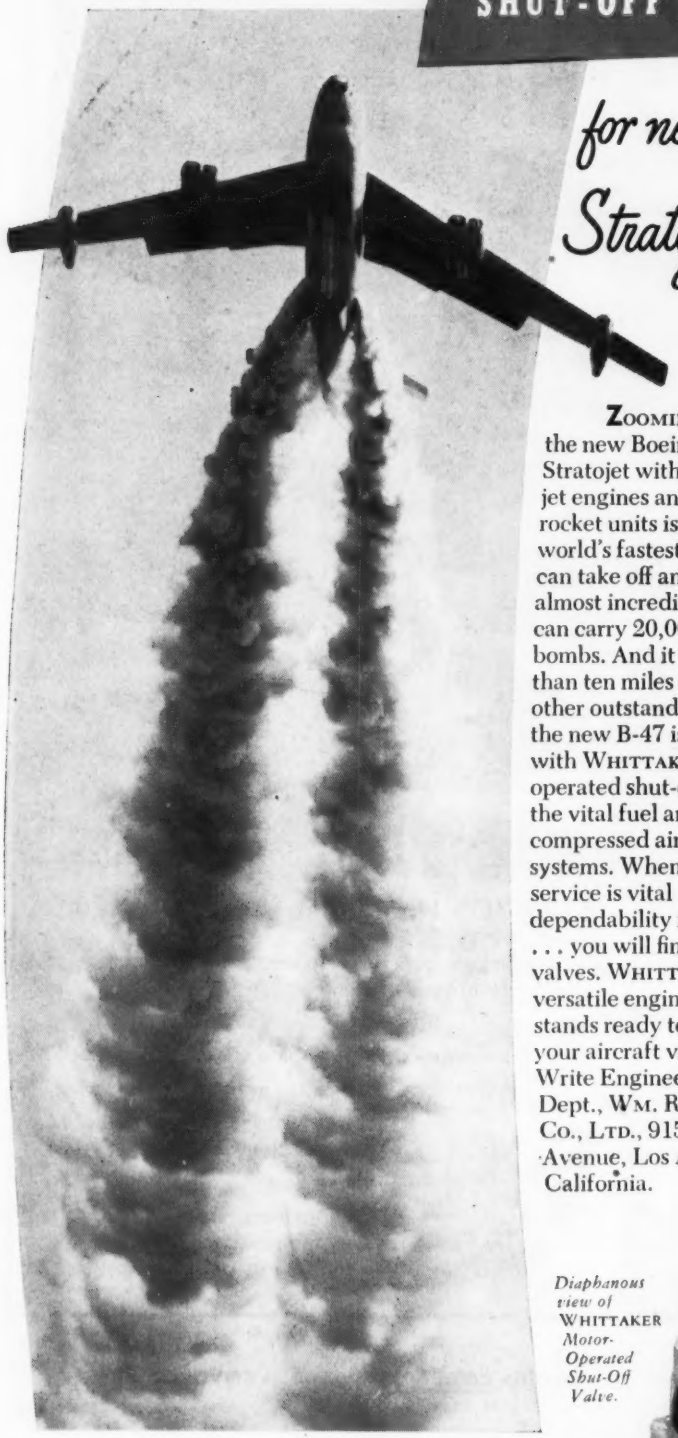
FAIRCHILD ENGINE AND AIRPLANE CORPORATION
HAGERSTOWN, MARYLAND

Boeing Selects WHITTAKER SHUT-OFF VALVES for new B-47 Stratojet



ZOOMING into the sky, the new Boeing B-47 Stratojet with its six powerful jet engines and auxiliary rocket units is one of the world's fastest bombers. It can take off and climb at almost incredible speed. It can carry 20,000 pounds of bombs. And it flies at better than ten miles a minute. Like other outstanding aircraft, the new B-47 is equipped with WHITTAKER motor-operated shut-off valves on the vital fuel and jet engine compressed air take-off systems. Whenever the service is vital . . . whenever dependability is a must . . . you will find WHITTAKER valves. WHITTAKER'S versatile engineering staff stands ready to assist you on your aircraft valve problems. Write Engineering-Sales Dept., WM. R. WHITTAKER CO., LTD., 915 North Citrus Avenue, Los Angeles 38, California.

Diaphanous view of WHITTAKER *Motor-Operated Shut-Off Valve.*

Whittaker

First IN DESIGN

First IN PERFORMANCE

First WITH VALVES THAT ARE FIRST CHOICE IN INDUSTRY

862nd AF Specialized Depot
Dayton, Ohio
831st AF Specialized Depot
Shelby, Ohio
822nd Specialized Depot
Maywood, Calif.
Watson Laboratory
Red Bank, N. J.
(Electronics)
Cambridge Field Station
Cambridge, Mass.
(Electronics)

Bureau of Aeronautics

Dallas, Texas—Naval Air Station.

Cherry Point, N. C.—Marine Corps Supply Depot.

Corpus Christi, Texas—Naval Air Station.

Jacksonville, Fla.—Naval Air Station.

Memphis, Tenn.—Naval Air Technical Training Command.

Miami, Fla.—Naval Air Station.

Norfolk, Va.—General Supply Depot.

Patuxent River, Md.—Naval Air Testing Center.

Pensacola, Fla.—Naval Air Training Bases.

Santa Ana, Calif.—Marine Corps Air Station.

Washington, D. C.—Naval Research Laboratory.

Information Service Helps Suppliers

Munitions Board has provided a Military Procurement Information Center in Washington, aimed at directing the supplier to the appropriate office in the Department of Defense which is in the market for the specified products or services he sells.

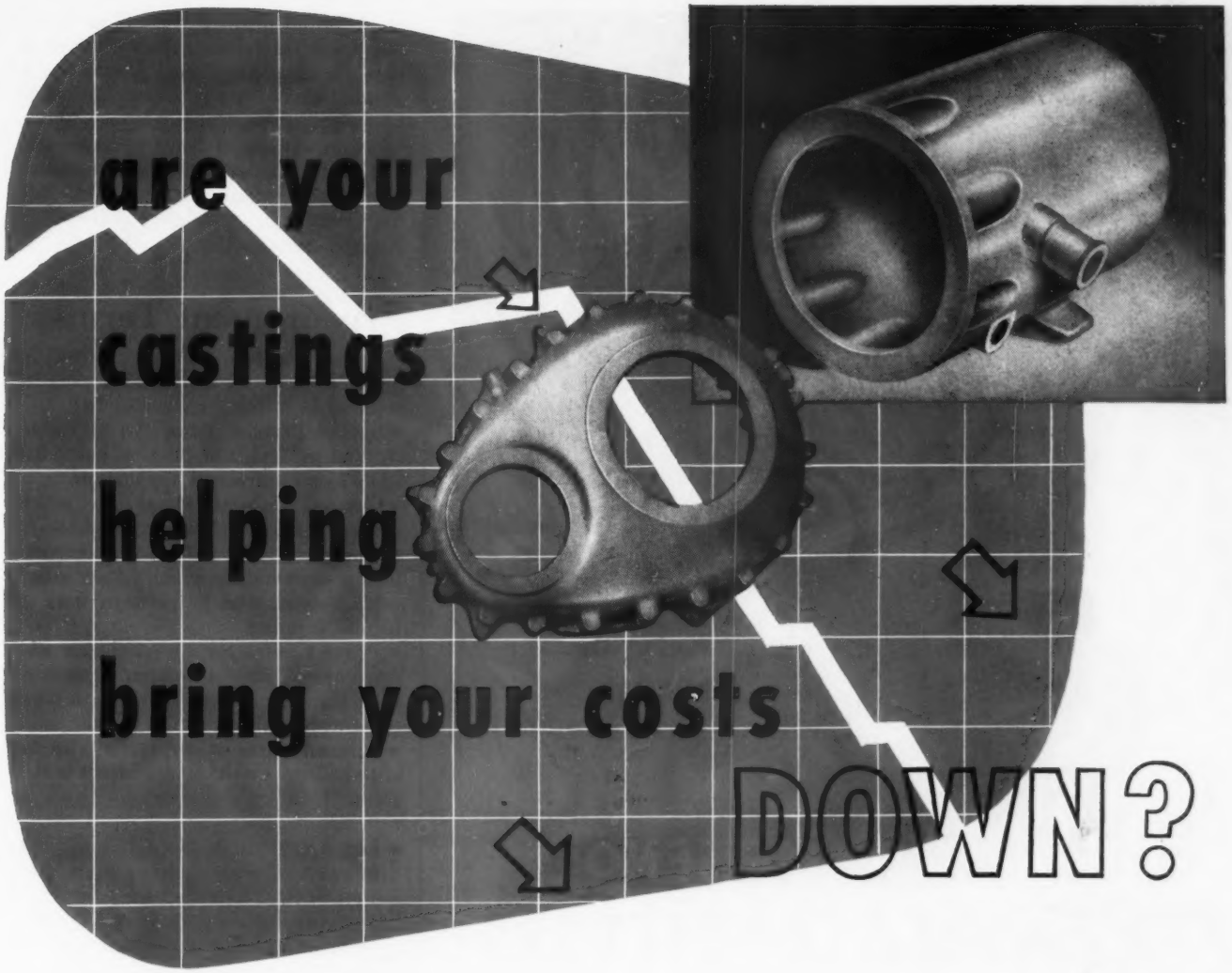
Located in the Pentagon, the office is staffed by civilian and military personnel who will help guide manufacturers, but will not assist in obtaining contracts.

The military procurement information office answers questions by telephone, letter and personal interview. In each instance, the person inquiring is referred to the office or person directly involved with procurement of the product in question.

▶ **Tip**—The information office offers this tip: If you live outside of Washington, write, wire or phone, rather than call in person. In many instances, the procurement office through which you should deal is located nearer to your place of business than Washington.

In its first 15 days of operation, the office answered 1708 telephone calls for information, 831 letters of inquiry, and conducted 666 personal interviews, 80 percent of these inquiries coming from firms employing less than 100 persons.

Three military representatives are



A SURVEY of your aluminum castings requirements by Permite engineers may bring you important economies.

Structural design recommendations, made by Permite aluminum casting specialists, often increase the originally planned strength and bring savings in metal and machining, without affecting the utility of the part.

Also available to you, is Permite metallurgical cooperation in selecting the best alloy to provide all the desired qualities in the casting at the *lowest ultimate cost.*

The vast Permite foundries provide today's most advanced facilities for producing aluminum castings by the permanent mold, semi-permanent mold, sand or die casting processes. Complete laboratory control and strict inspection procedures guard the quality of your castings from start to finish.

Permite service and castings are helping many manufacturers bring costs down. Submit blue prints for recommendations and estimates on your castings requirements.

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DETROIT: 809 New Center Building. NEW YORK: 9 Rockefeller Plaza. CHICAGO: 64 E. Jackson Boulevard. ATLANTA: 413 Grant Building.

ALUMINUM PERMANENT MOLD, SAND and DIE CASTINGS...HARDENED, GROUND and FORGED STEEL PARTS

AMPHENOL

FIREWALL CONNECTORS

Operate Continuously at Destructive Temperatures

For aircraft firewall, jet engine, thermocouple and other high temperature installations, Amphenol offers the best heat-resistant and vibration and shockproof electrical connectors. Connectors are of a unique one-piece design manufactured of steel protected by cadmium plating. Ceramic dielectric inserts, shock mounted, protect the contacts at abnormally high temperatures.

With silver plated contacts, circuit continuity is not impaired, and selected alloys retain spring tension and function with lowest milivolt drop.

Amphenol Firewall Connectors have been subjected to the full C.A.A. requirements and have continued to operate efficiently long beyond the test time limit. Amphenol, again, has given the aircraft industry a new contribution to safety in the air. Amphenol's Firewall Connectors are also an indispensable new tool for high temperature industrial applications.

AMPHENOL

Write to Department J on Company letterhead for Amphenol Catalog A-1 and the supplement A-1-B, a comprehensive listing of firewall connectors.

AMERICAN PHENOLIC CORPORATION
1830 SO. 54TH AVENUE
CHICAGO 50, ILLINOIS

on full-time duty in the office. Major Sid Spear interviews callers with products for the Air Force; Capt. A. A. Machidlausky handles Army callers; and Lt. Joan Flickenger, USN, answers questions on matters of Navy procurement.

The Military Procurement Information Center is located in room 3-D-760, the Pentagon; telephone number is Republic 6700, extension 75321.

Procurement Terms

These established definitions will be useful to manufacturers and dealers interested in military contracts:

- **Special Purpose Item:** An article restricted by design or physical characteristics to an individual application.
- **General Purpose Item:** An article adapted to more than one application.
- **Contractor:** An individual, company, firm or corporation which enters into a written agreement to perform work or furnish supplies.
- **Prime Contractor:** A contractor who has entered into a written agreement with the government to perform work or furnish supplies.
- **Subcontractor:** A contractor who has entered into a written agreement with a prime contractor to perform work or furnish supplies.
- **Licensor:** An individual, company, firm or corporation, holding proprietary design rights, manufacturing methods or patents who enters into a written agreement whereby these rights, methods, or patents may be used by other individuals, companies, firms, corporations or the government.
- **Licensee:** An individual, company, firm or corporation authorized by a licensor to use his proprietary design rights, manufacturing methods, or patents in the manufacture of articles offered for sale.
- **Manufacturer:** An individual, company, firm or corporation engaged in the fabrication of finished or semi-finished products.
- **Modification:** The physical alteration of a special or general purpose item, accomplished to permit a specific adaption of the modified article.
- **Commercial Item:** An article designed for and available on the open market.
- **Specification:** A description of the technical requirements for a material, an item or a service, including a procedure by which the purchaser can determine whether or not the requirements have been met.
- **End Item:** A unit which, in itself, accomplishes a specific complete function.
- **Assembly:** A unit of an end item composed of two or more parts fastened together. Assemblies may be referred to as "subassemblies" and "sub-subassemblies" to indicate their relationship to a

here it is: THE NEW ADEL 3000 PSI NON-INTERFLOW 4-WAY SELECTOR VALVE*

The first **3000 PSI** *Non-Interflow Selector Valve*

- ★ EXTREMELY LOW HANDLE LOAD
- ★ NEGLIGIBLE PRESSURE DROP
- ★ EXCELLENT LEAKAGE CHARACTERISTICS
- ★ MORE THAN MEETS PROPOSED AN REQUIREMENTS
- ★ MINIMUM WEARING PARTS

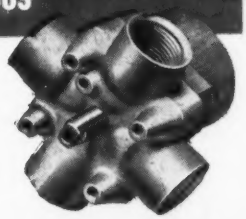
#20907 ¼" AND ⅜" 4-WAY SELECTOR VALVES

TOTAL PRESSURE DROP:
15 psi at 2 gpm flow,
37 psi at 3½ gpm flow
HANDLE LOAD:
17 inch-lbs. at 1500 psi,
20 inch-lbs. at 3000 psi
1 Drop-per-min. internal leakage max. at 3000 psi

#20908 ½" 4-WAY SELECTOR VALVE

TOTAL PRESSURE DROP:
45 psi at 6 gpm
HANDLE LOAD:
22 inch-lbs. at 1500 psi,
30 inch-lbs. at 3000 psi
1 Drop-per-min. internal leakage max. at 3000 psi

#20909 ¾" 4-WAY SELECTOR VALVE



TOTAL PRESSURE DROP:
60 psi at 16 gpm
HANDLE LOAD:
30 inch-lbs. at 1500 psi,
40 inch-lbs. at 3000 psi
1 Drop-per-min. internal leakage max. at 3000 psi

Here's Adel's new line of lightweight 3000 psi, non-interflow 4-Way Disc Type Selector Valves with extremely low handle torque, negligible pressure drop and excellent leakage characteristics. More than meeting the latest proposed AN Specification requirements, they represent the most advanced engineering design for 3000 psi manually-operated Selector Valves. Non-interflow design completely eliminates all undesirable interflow when changing shaft positions. No moving packings under system pressure. Hydraulic sealing is accomplished by hardened surfaces that are optically flat within one eleven-millionth of an inch. Available with or without detents in ¼", ⅜", ½" and ¾" line sizes with a wide variety of flow patterns. ADEL PRECISION PRODUCTS CORP., 10777 Van Owen Street, Burbank, California.

*Patent Pending

TYPICAL FLOW PATTERNS

ADEL

ADEL PRECISION PRODUCTS CORP. • Burbank, Calif. • Huntington, W. Va.

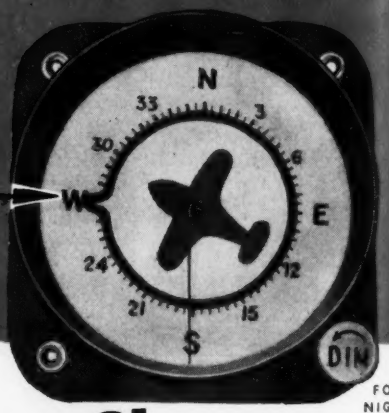
Canadian Representative: RAILWAY & POWER ENGINEERING CORPORATION, Limited

Lear OMNIMATIC

THE *Only* AUTOMATIC VHF OMNIRANGE NAVIGATOR

TUNE IN THE **VOR** STATION

WITH INSTANTANEOUS **OMNISCOPE** INDICATOR



FOR NIGHT USE

READ THE MAGNETIC BEARING FROM YOU TO THE **VOR** STATION

ENSITIVE VHF RECEIVER AND IGH POWER VHF TRANSMITTER

No Static···No Noise—Crisp···Clear Communication···Steady, Accurate Navigation

INSTANTANEOUS

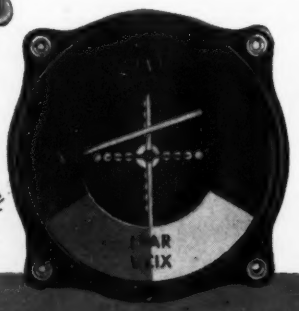
Tune in a VOR station, instantly the steady "pip" on the face of the Omniscope's circular pattern accurately indicates the magnetic bearing to the VOR station.

Lear OMNITENNA

AUTOMATIC

Tune in the station – Read the bearing. Five times easier and faster than old style manual VOR units.

FLY AND USE THE VHF VISUAL AURAL RADIO RANGE WITH THE VAR ADAPTER



Lear VCIX

FLY AND USE THE ILS RUNWAY LOCALIZERS WITH THE VAR ADAPTER

INSURED COMMUNICATION AND NAVIGATION—

RADIO AT ITS BEST···WHEN THE WEATHER IS AT ITS WORST!

LEAR INCORPORATED

GRAND RAPIDS, MICHIGAN
LOS ANGELES, CALIFORNIA

"The Name Men Fly By"

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The plans are being revised constantly. Such things as new models of tools, and new production tool designs for manufacture of new end items like jet engines, makes constant revision of the tool and equipment standby program a necessity.

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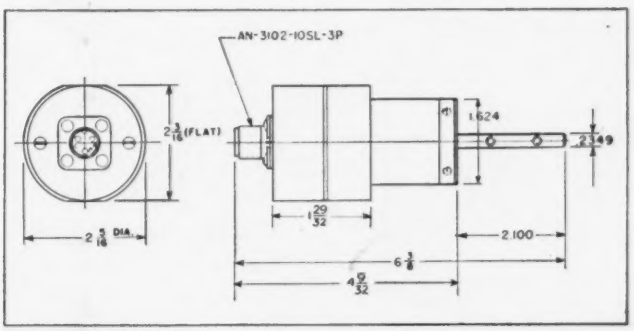

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B-36: A Procurement Study

Bomber development shifts caused many procurement problems, which affected contractor down to supplier.

Procurement pattern for the Consolidated-Vultee B-36 intercontinental bomber is typical of the convolutions of a major military airframe contract from design competition to large scale production. This pattern is of interest not only to airframe contractors but also to suppliers of engines, accessories, and subcontracted components since every shift in the major airframe contracted is reflected down the line to every supplier concerned with the project.

In the spring of 1941, the then-Army Air Corps laid down the requirement for a 10,000-mi. bomber capable of delivering a 10,000-lb. bomb load. Original requirement specified a cruising speed of between 240 and 300 mph. Later an altitude requirement of 40,000 ft. was added. The requirement grew out of the 20-year desire of the Air Corps to produce an intercontinental bomber that would truly be a "battleship of the air."

▶ **Desire Spurred**—This long-nurtured desire was made timely by the military picture facing the United States in early 1941. Defeat of England was not only possible but probable leaving this country to face the Germans across a hostile Atlantic. The intercontinental bomber requirement sought a weapon with which to fight across the Atlantic regardless of who controlled the surface waters.

The Air Corps initiated a design competition on April 11, 1941 and invited Boeing Airplane Co. and Consolidated Aircraft Corp. to submit preliminary design studies. Boeing and Consolidated were then the only two makers of heavy bombers (B-17 and B-24). Later Northrop Aviation Inc. was asked to apply its flying wing principle to the intercontinental bomber requirement, and Douglas Aircraft Corp. was invited because of its experience with the experimental B-19.

▶ **Consolidated Wins**—A special conference was called by Gen. H. H. Arnold on Aug. 19, 1941, to push the intercontinental bomber project and on Oct. 3 Consolidated's preliminary design was picked as the most promising for further development. Consolidated received a cost-plus-fixed-fee contract on Nov. 15 to build two experimental B-36 intercontinental bombers with a Munitions Board priority of A-1-B, a relatively high priority at that time.

Consolidated was merged with Vultee Aircraft Corp. to make the new firm of Consolidated-Vultee Aircraft Corp., with Tom Girdler as president.

In the summer of 1943 Girdler talked with the then asst. secretary of war, Robert Patterson in Washington regarding an increase in the B-36 order. Girdler told Patternson it was difficult to get sub-contractors to work on an experimental order for only two planes whereas they would be interested if the plane had some promise of large scale production. Patterson directed that Convair be given a production order for 100 B-36 bombers in addition to the two experimental models. Convair got the letter of intent for the 100-plane order on July 23, 1943 with a priority rating of AA-1.

▶ **Priority Lowered**—Meanwhile the Army Air Forces began to think of the B-36 as a weapon for the Pacific war. China appeared likely to become untenable as a base for air attack on the Japanese Islands and Pacific advance bases were far out of B-29 range of Japan. Convair transferred the B-36 project from its San Diego plant to the new government-financed plant at Ft. Worth, causing considerable delay. Wind tunnel tests were delayed until the spring of 1944 because of higher priority projects clogging NACA tunnels.

In the middle of 1944 the Mariana campaign opened bases that were within B-29 range of Japan and the B-36 again was dropped in priority at the expense of expanded production of B-29 and B-32 bombers that were now assured of adequate range to strike at Japan from the new bases.

On July 15, 1944, Convair was ordered to speed up its B-32 program at expense of B-36 work. When the B-36 letter of intent was replaced by a cost-plus-fixed-fee contract on Aug. 19, 1944, it carried no priority rating.

▶ **Postwar Plans**—With the end of the war the first XB-36 had not yet been completed and the entire intercontinental bomber project again came up for re-evaluation. During planning discussions on the composition of the postwar Air Force, AAF generals affirmed their belief that the tremendous campaigns of the war aimed primarily at securing advance bases to bring enemy countries within the then limited range of U.S. air power made the requirement for an intercontinental bomber that would need no advance bases even more acute. Formation of four B-36 groups as the nucleus of an intercontinental striking force was approved as part of the 70-group Air Force program in the summer of 1945.

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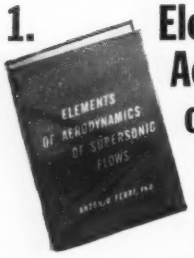

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In evaluations preceding this decision AAF planners concluded that the B-36 was the most efficient airplane for long-range missions when compared with the B-29 and B-35, and was about half as costly to operate as the B-29 in terms of cost per ton mile. At this time the change from single wheel to double tandem landing gear was specified to eliminate the need for building special runways to accommodate the landing impact of the B-36.

▷ **Ft. Worth Troubles**—During the summer of 1945 the B-36 project was beset with a variety of troubles at Ft. Worth. First Air Materiel Command inspectors found faulty workmanship and use of substandard materials on the XB-36. AAF expressed continued dissatisfaction with the management of Convair's Ft. Worth plant and became increasingly irritated at the failure of Convair to change the situation. A strike at Ft. Worth and other lesser labor troubles helped retard B-36 progress.

The XB-36 was completed and made its first test flight on Aug. 8, 1946. YB-36, which incorporated all the post-war changes urged by the Air Force, was scheduled for delivery in 1947 and was to serve as the production prototype for the 100 planes on order. Ft. Worth was then engaged in tooling up for B-36 production.

▷ **Kenney Objects**—Fourth evaluation of the B-36 program was touched off by Gen. George Kenney, head of Strategic Air Command, in December, 1946. Kenney recommended the B-36 order be reduced from 100 to a small service test order. Kenney felt that the B-36 was inferior to the B-50 in everything except range and bombload. In the discussion stimulated by Kenney, Air Materiel Command opposed his views on the grounds that most of Kenney's objections could be eliminated through design and equipment improvements on the B-36. Gen. Spaatz, then USAF chief of staff, supported AMC in overruling Kenney.

Early performance of the XB-36 indicated engines were one of the major problems. To meet this problem, Convair proposed, early in 1947, to install the Pratt & Whitney VDT power plant in the B-36. This would have meant switching from pusher to tractor engine installations but would have added performance to bring the B-36 up to 410 mph. top speed and 45,000 ft. ceiling, retaining the 10,000 mi. range and 10,000-lb. bombload.

▶ **VDT Approved**—After initial objections from the Air Force research and development experts, due to financing, the VDT project was approved. Funds were to come from a cutback of three planes in the 100-plane order rather than from research and development funds. Later special propeller and supercharger development were financed at the expense of two more planes. The VDT powerplant was scheduled for installation in a prototype B-36C.

In the summer of 1947 a new group destined to have considerable effect on procurement was created—the 16-man Aircraft and Weapons Board. Main topic at the initial meetings of the board Aug. 19 and 22, 1944, was the future of the B-36. The board decided to continue production of 100 B-36 bombers and use the plane as a special purpose bomber for delivery of atomic bombs. The Boeing B-50 was picked as the workhorse all-purpose bomber of the USAF, and stablemate of the B-36. The Boeing B-52, then a 500,000-lb. turboprop bomber powered by Wright T-35 engines was considered to be the replacement for the B-36 as the special long-range atomic bomber. The board also re-examined the B-36 VDT proposal and recommended that it be scrapped largely because of additional expense and delays in getting the B-36 into service. At the time the board met, only the XB-36 was flying and it had been out of commission intermittently since March, 1947. Its performance was hardly stirring.

▶ **Convair Troubles**—During the latter half of 1947 Convair began to have a variety of troubles with the B-36 program. Funds originally appropriated for the B-36 program would expire at the end of fiscal 1948 (July) and a new appropriation would be needed from Congress to finance the contract. Airframe production schedules were out of joint with those of engine, propeller and accessory manufacturers. Finally, Convair was faced with what to do with its Ft. Worth personnel after completion of the B-36 contract.

Delays in government - furnished equipment forced stretching the B-36 production program out over an extra year leaving an additional 17 months of financing required after the funds already appropriated would expire. The slowed-down production program, caused by lack of government-furnished equipment cost the government an estimated $1 million per month in items for which Convair had to be reimbursed under the cost-plus-fixed-fee contract.

▶ **Fund Problem**—Meanwhile, Convair was getting jumpy over whether funds would be provided to complete the contract for 100, now down to 95 planes. While Convair could eventually recover money paid to subcontractors on a cancelled contract, it meant a long, drawn out procedure through the Court of Claims, and the problems of retaining its own engineering and production personnel would have remained unsolved.

All of these problems are typical of the dilemma faced by both USAF and its aircraft contractors under the present system of military procurement. When appropriations and procurement

planning has to be conducted on an annual basis for projects that require from five to seven years from inception to completion it is impossible to do it with even a reasonable degree of efficiency or economy.

► **Static Test**—The first B-36A was flown from Ft. Worth to Wright Field for static testing on Aug. 30, 1947. On Sept. 4, Convair presented another proposal for reviving the B-36C VDT project.

It proposed that the VDT power plant be installed in the final 34 airplanes of the contract. Air Materiel Command endorsed the project but pointed out that cost of additional government-furnished equipment required by the VDT installation might total $15 million and that this would require a diversion of funds from the fiscal 1949 appropriation. Convair's second proposal to also rework the first 61 model A and B planes with the VDT was also considered feasible but decision was reserved.

The new Convair proposals were circulated among the Aircraft and Weapons Board on Oct. 15. The board, with the exception of Gen. Kenney, approved the proposal. With the approval of Arthur Barrows, undersecretary in charge of procurement, the new USAF Chief of Staff Gen. Hoyt Sanford Vandenberg approved the board's decisions and directed AMC to procure the B-36C. In the words of the Air Force, "the attempt to mate the VDT engine with the B-36 airplane turned out to be a complete failure."

► **Refueling Technique**—At this stage the concept of aerial refueling entered the picture of long-range bombardment. The Aircraft and Weapons Board was worried about the size necessitated by built-in range (the 500,000-lb. B-52) and sought an out in developing aerial refueling for the B-50 to give it intercontinental range.

On Dec. 4, 1947 the YB-36 made its first flight. This was the production prototype, complete with all modifications and tactical equipment. In a series of test flights immediately thereafter the YB-36 reached 40,000 ft., indicating that many of the earlier engine problems had been solved and the airplane was capable of its designed altitude.

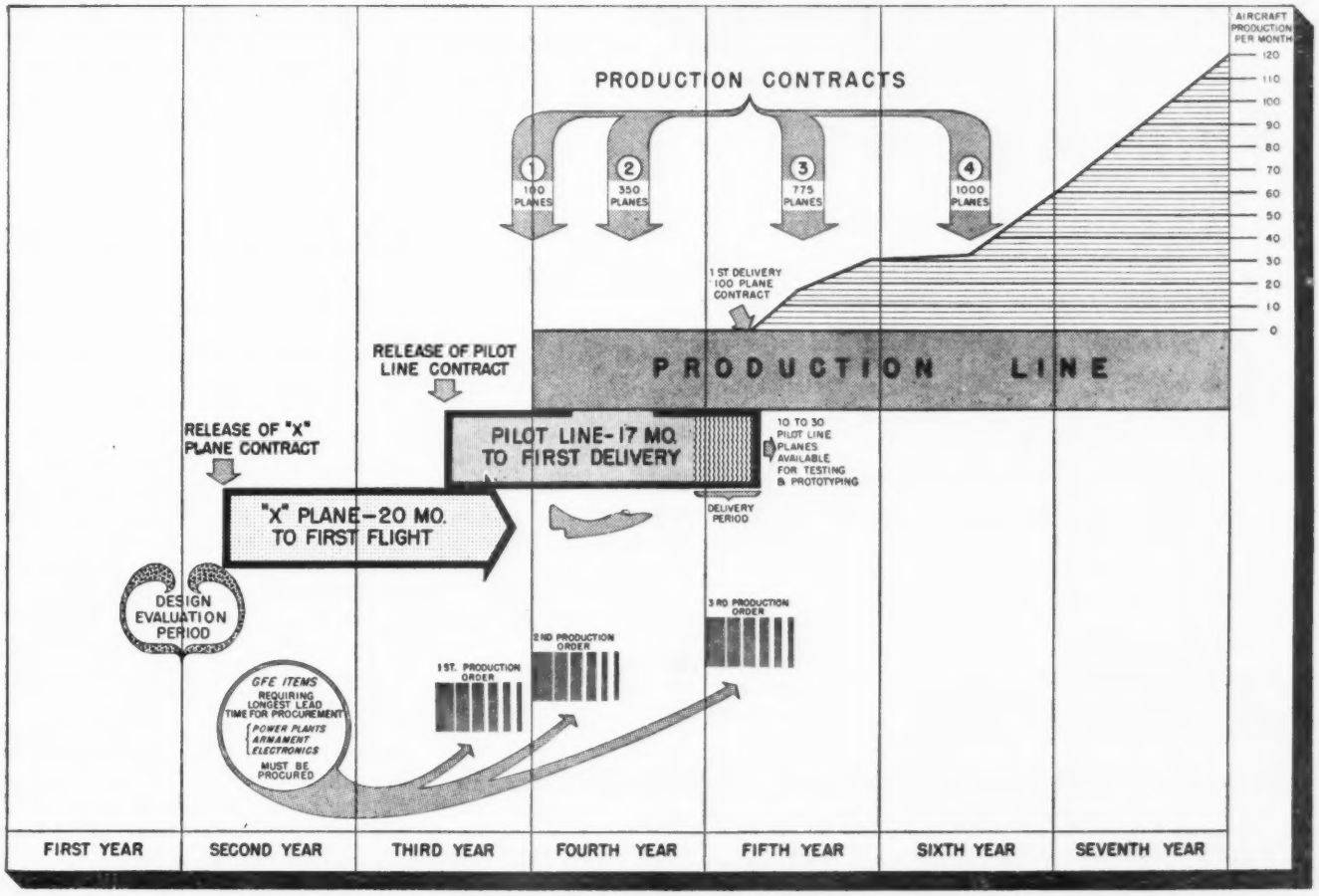
Meanwhile the VDT application to the B-36 was running into trouble largely because of cooling problems encountered at 40,000 ft. As a result of the engineering conference on the subject it was found that the cruising speed was reduced by 60 mph. from previous estimates and the range by 1800 mi. On Apr. 21, 1948, Gen. McNarney, then AMC commander, recommended cancelling the B-36C project since the B-36C promised to be inferior to the B-36B in both speed and range. The B model was powered by 3500 hp. P&W R-4360-41 piston engines.

► **New Evaluation**—Cancellation of the VDT program would mean a new evaluation of the entire B-36 program. The subject made the rounds of the Air Staff, finding Gen. Kenney still opposed to building anything but a few B-36S for possible use as aerial tankers for the B-50.

He was supported by Gen. Norstad who recommended building just enough B-36's to outfit one bomb group as an experimental unit. Norstad's recommendation would have cut the B-36 contract back to 61 planes (giving 38 model Bs plus the model as earmarked for conversion as aerial tankers). An investigation of the entire B-36 program was then undertaken by the Inspector General.

The B-36 situation came to a head in a conference in Air Secretary W. Stuart Symington's office attended by Barrows, Vandenberg, Fairchild and McNarney on May 21. They decided:

AIRCRAFT-RESEARCH, DEVELOPMENT & PROCUREMENT PHASES



• To accept McNarney's recommendation to cancel the B-36C project.
• To accept at least 61 B-36 bombers.
• To delay decision of what would be done about the additional 34 planes still on order.

▶ **New Data**—Meanwhile the first B-36As were going through an extensive flight test program which yielded increasingly promising data. On June 15 Symington and his aides met again for a final decision on the B-36 procurement. Using the actual flight test data obtained from the B-36A performance it was determined that the B-36 offered better possibilities in combination of speed, range, altitude and bomb load than any other bomber available. At a continuation of this meeting on June 24 the decision was made to re-affirm the B-36 contract and proceed with production of the 95 on order.

The B-36 problem again was raised in January of 1949 as a result of the reduction of the Air Force to 48 combat groups from its current strength of 59 groups and planned strength of 66 groups. The Aircraft and Weapons Board had been replaced as the USAF top deliberative body by a Senior Officers Board consisting of the Vice Chief of Staff, Deputy Chiefs of Staff for Operations and Materiel and the head of Air Materiel Command.

This board, meeting in January 1949, supported recommendations of Lieut. Gen. Curtis LeMay, who had succeeded Kenney as SAC commander, that the B-36 was the best aircraft available to fulfill the USAF requirement for long-range strategic reconnaissance. Stability and range problems associated with the Northrop RB-49 jet Flying Wing, had reversed an earlier decision to use the Wing for strategic reconnaissance. Decision resulted in purchase of 39 additional B-36 models for use as bombers and conversion of the B-36A models to RB-36Es.

▶ **Increase Proposal**—Two months later the board was presented with a proposal to increase B-36 performance by addition of four turbojet engines to the six piston engines. This was aimed at remedying the one remaining tactical defect in B-36 performance—speed over the target. With the jet boost it was estimated the B-36 could reach a top speed of 435 mph. at 50,000 ft. Meanwhile LeMay had asked for two additional B-36 groups for Strategic Air Command and recommended their purchase at the expense of the Boeing B-54 which used the VDT powerplant. The board approved LeMay's recommendations in April, 1949, and authorized purchase of an additional 36 B-36 bombers and modification of all B-36s produced or on order with the additional four turbojet engines. This final order boosted Convair's total B-36 business to 169 planes plus the XB-36, at a total cost to the government of nearly $1 billion dollars. Additional 1950 and 1951 orders are expected to raise the total B-36 orders to 250.

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Catalog Program

New Munitions Board system aims to eliminate costly duplication.

A new Munitions Board system of common cataloging will reduce duplication in separate service procurement, but is likely to cause widespread reductions in military orders of stock items.

The cataloging job—encompassing more than 5 million separate items—is expected to be completed in July, 1952. Actual timetable runs this way: Already cataloged, 150,000; by next July, 833,000; early 1952, 2½ million.

Munitions Board will give each of these items new stock numbers, reducing all similar items to one common number which will be standard for all the military services and government procurement and stock bins.

▶ **No Change in Procedure**—Industry

will not have to worry about this new numerical designation since supply items will continue to be procured as before. But the Munitions Board will be on the lookout for instances where some manufacturers have taken one item which is used interchangeably in different components and assigned it different manufacturers numbers. In this way, these manufacturers can supply the item on a different number for each component, varying prices and doubling up on orders.

Up to now, each service has had its own style of numbering. The Navy, for example, used a multiple number-letter-number system like this—42-P-5550. Here's what the numbers mean: The figures on the left denote the class of the commodity, such as hand tools, electronic equipment, etc. The digits given on the right identify the items within the class.

Main reason for the switch to numbers from letters is that the new stock control will be handled by electric card punch systems, which work better with an all-numerical system.

▶ **You Can Help**—Industry will soon be asked to help out in this common cataloging. Its job will be to stop assigning different manufacturing numbers to identical items, even though these items may be in different end products.

Actually, the cataloging is for the use of the services, and not industry. Procurement will still be by specification, and that specification will conform to one main number in the catalogs. A company may make the item under its own manufacturer's code number, but when it is delivered to military supply depots and put into a bin, it will carry the military number assigned to its description.

In this way, the Munitions Board hopes, there will be no duplication in stock rooms, even though manufacturers each may have a different number for the item. More important, the Munitions Board feels it will be able to cut down duplicate procurement of many items since an accurate and complete check of the number on hand will be facilitated by the single system classification.

Up to now, large stocks of an item, have been available for use, but under a different number. Consequently, the services have reordered items where bins indicate diminished supplies of one number, although huge supplies of the exact same item, under a different number, lay untouched.

▶ **Examples**—To prove this, Munitions Board researchers, who have been working with the problem for some time, cite these examples:

• Navy buys a certain accessory from a company and the unit has a screw which is listed under two numbers. One number screw costs 5 cents; the other 10 cents, although both screws are identical. But Navy also has this screw, under a still different number, which it buys by the barrel as part of its standard stock, at seven-tenths of a cent. Under the new system, all three screws have one number and the manufacturer no longer sells replacement screws at two different prices. Navy now buys its replacements at less than one cent apiece.

• A manufacturer, who used to have 271 numbers for cotter pins which were all the same size, now has only one number. A supplier used to attach 253 numbers to one nut; another calls a bolt by 322 numbers; still a third manufactures a screw under 262 numbers.

CAA Has Record Fiscal 1950 Budget

Civil Aeronautics Administration will spend $4.2 million of its fiscal 1950 funds on expanding its airport lighting and airways programs. This is a part of CAA's record $206,548,605 budget, $56,737,106 over the fiscal 1949 figure.

Airport lighting program will cost $4 million, $2.5 million of which will come from federal funds. Remainder will come from sponsors. CAA's share of a $2 million high intensity lighting program will be $1.5 million. Other programs are for medium and low lights, parking lights, etc. CAA has plans for 100 lighting programs and less than half of them are for high intensity lights.

In its airways program, CAA plans to spend:

• $53,000 for completion of a high intensity lane.

• $95,218 to construct beacon and obstruction lights at Juneau, Alaska.

• $20,400 to relocate 12 beacons in the U. S.

• $28,700 to move two sets of runway lights from intermediate airports which are now closed, to other fields. Total cost will be $197,318.

From its fiscal 1949 budget, CAA plans these expenditures:

• $106,000 for field lights and $15,000 for approach lights at Anchorage, Alaska.

• $45,000 for field lights at Canton, Alaska.

• $45,000 for field lights at Wake, Alaska.

• $60,000 for field lights at Fairbanks, Alaska.

Washington National Airport will receive $1,446,500 in CAA allocations for fiscal 1950, with $1,250,000 earmarked for operation and maintenance, and $196,500 for construction. This is slightly more than the fiscal 1949 allocation of $1,185,000 for operations.

CAA plans construction of international airports at Fairbanks and Anchorage, Alaska, to cost $5.8 million. Under its regular airport program, the agency

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has allocated $51 million—$14.5 million cash and $36.5 million contract authorization.

License fee question on the Bartow high intensity runway lights will continue to hold back programs for this type of lighting until they are resolved between CAA legal department and the Wellsbach Corp., Philadelphia, owner of the patents. Wellsbach had asked a fee of 80 cents a runway foot, and conferences are being held in an effort to arrive at a compromise figure somewhat lower.

$20 Million for Industrial Planning

Joint USAF-Navy mobilization program is studying best and quickest methods for production in an emergency.

Integration of individual industrial plans of USAF and Navy Bureau of Aeronautics into a joint national aeronautical industrial mobilization program has paved the way for new efficiency in this field.

Joint USAF-BuAer Industrial Mobilization program calls for 28 "package" programs on aircraft components prepared jointly by the two services, 18 programs on airframes prepared by USAF industrial planning division, and programs on airframes prepared by BuAer industrial planning division.

► **Working on Revisions**—First "editions" of the plans have been completed. Revisions of them have been started in cycles to insure that new industry research and technical progress does not out-date them.

Each plan is a complete package on requirements for producing a specific aircraft or component. Manufacturers will be listed with peak production rates required. Individual manufacturers' potential production, current status of product and additional design requirements for high volume production will be shown.

Other data in the package will include plant capacity, machine tools, manpower and complete plant assignments for a subcontracting program.

Approximately $20 million has been earmarked for fiscal 1950 industrial planning contracts to implement the overall program for mobilization in event of emergency—$16 million by USAF and $4 million by the Navy on aviation industrial planning.

► **$13 Million for Studies**—Approximately $13 million will be expended in contracts with individual manufacturers for high volume production studies of specific military equipment.

USAF planning emphasis this year is on powerplants with contracts to General Electric, Allison and Pratt & Whitney, for high volume studies on their current production jet engines and forthcoming new models. Additional sums have been set aside for these similar studies: small engines for trainers and liaison planes, propellers, fire control systems, bombing systems, bombsights, radio and radar, landing gears, turbo-superchargers, test equipment, auto-pilots, instruments, and ground handling equipment.

USAF expenditures budgeted for fiscal 1950 also include $1,625,000 for standby plants and equipment; $2,521,000 for reserve machinery and equipment; $750,000 for resource requirement data on manpower, machine tools, etc.; $400,000 for purchase of engineering and technical services on studies of new industrial techniques, analysis of planning data, and development of new manufacturing equipment. Smaller sums cover continuing existing preparedness contracts, and purchasing basic studies on industry expansibility.

► **Navy Plans**—Navy industrial planning high volume study contracts in 1950 are for a new airframe and a turbojet engine, with Westinghouse expected to get the engine study contract. Other budgeted Navy expenditures: Standby plants, $120,000; machine tools and production equipment reserve, $1,146,000; plant utilization studies, $354,000 and industrial resources studies, $844,000.

Success of initial licensor-licensee planning programs and of experimental

MAJ. GEN. F. M. HOPKINS, JR.
Former head of industrial planning division is new deputy to the commanding general for operations.

subcontracting programs such as the J-47 engine and B-47 bomber programs (See Page 41), probably will lead to additional emphasis on these means of quick production expansibility in 1950.

Licensor-licensee planning introduces manufacturers, who are scheduled to make a complete product under license in event of emergency mobilization, to the product which they would make through pre-production planning. Thus, they will be prepared to speed their own production of the item with a complete plan for its production and with necessary equipment and plant layout. Licensing agreements tentatively are completed and ready to be put into operation on short notice.

▶ **Change Problem**—Industrial planning divisions both at AMC headquarters Wright-Patterson AFB Dayton, Ohio, and at the Navy Building, Constitution Ave., and 21 St., are up against a problem of continual changes in requirements which necessitates very frequent revisions in planning.

They work well beyond the scale of any present aviation procurement program, but at the same time make every effort to key present procurement into plans for all-out industrial mobilization so that production shifts, etc., can be held to a minimum.

Contractual framework on which most of the overall planning is based involves two principal types of contracts to industry:

• **Resources requirement contracts,** which purchase specific management plans of operation to meet a specified mobilization schedule and sets up requirements for plant facilities, machine tools, related production equipment, materials, manpower and subcontractors.

• **Production preparedness contracts,** designed to relieve potential production bottlenecks in advance. Such contracts, depending on seriousness of a shortage in some component, may go so far as to provide for redesign of a critical item for high volume production, with complete manufacturing planning, tool design and tool construction to meet a specified high production schedule.

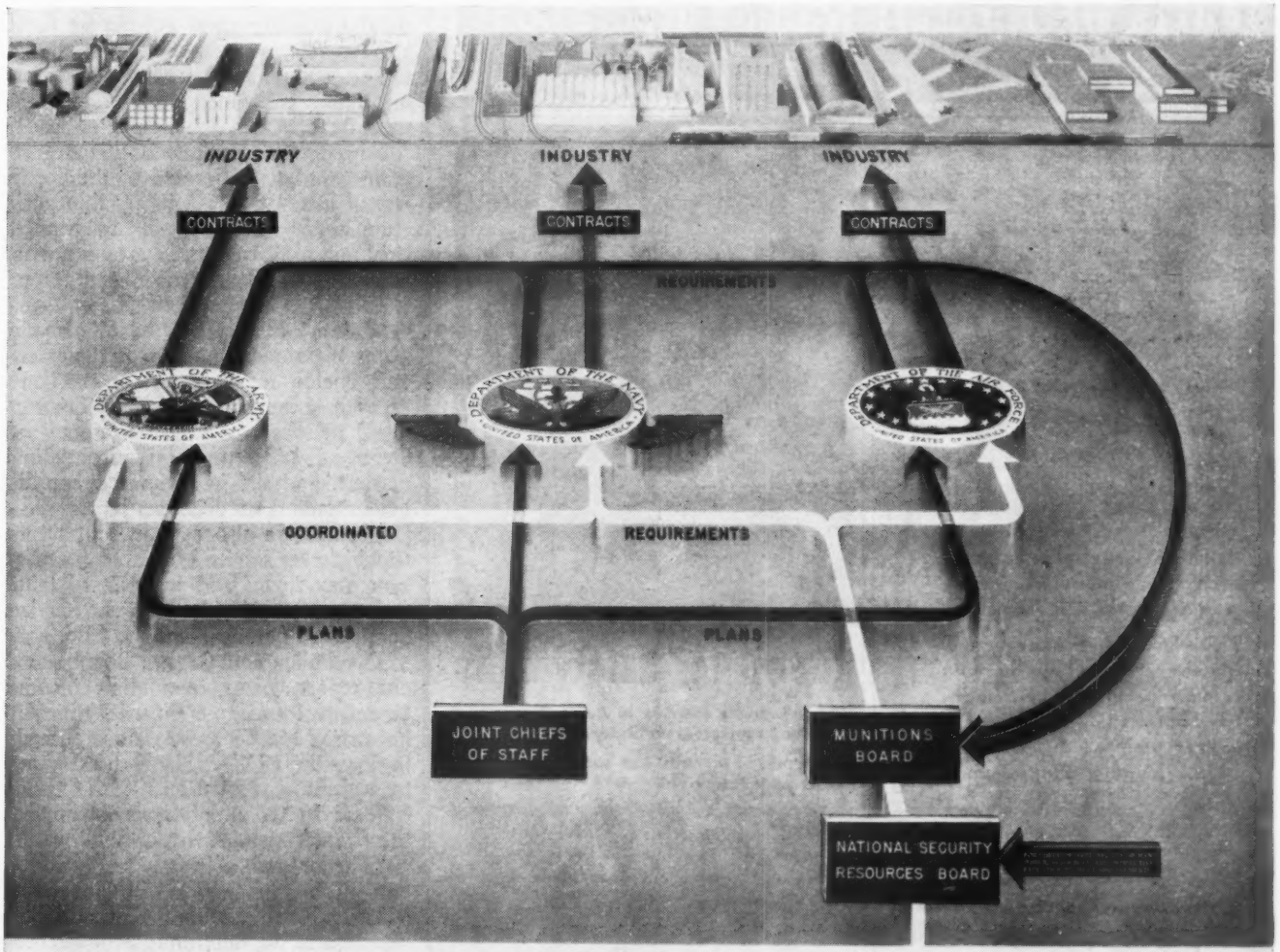
Other contracts on specific research problems include basic economic data research to determine expansibility; development of new and substitute materials sources; development of high volume manufacturing methods and tooling; studies on decreasing vulnerability of the aeronautical industry to enemy action through dispersal, underground plants, camouflage and multiple sources; and establishment of standby plants and machine tool reserves.

▶ **More Progress Seen**—Both USAF and Navy industrial planners consider development of substitute materials for some of the more critical materials one of the major planning accomplishments of the past year, and look for great additional progress in this field next year.

Fluctuations of the current program seriously affect the long-range planning work, it is pointed out, since any mobilization plan must start from a basis of current production and capacity.

USAF's industrial planning division, until recently headed by Maj. Gen. F. M. Hopkins, Jr., is now under direction of Brig. Gen. A. H. Johnson. Lt. Col. W. R. Carter continues as deputy division chief.

Navy BuAer industrial planning division is headed by Comdr. R. M. Rey-



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nolds, who recently succeeded Comdr. R. J. H. Conn. Leonard N. Thomas is the civilian assistant director.

Renegotiation

Problem affects only companies with gross of over $100,000.

Renegotiation—the review of profits accruing from large business dealings with the government—continues to be a matter of serious concern to the larger aircraft contractors, under 1948, 1949 and 1950 fiscal year procurement.

All contracts for aircraft and related material and sub-contracts amounting to more than $1000 are subject to renegotiation, if:

- **The gross business** of the contractor or sub-contractor under these contracts amounts to more than $100,000 in a fiscal year, and
- **The contracts were signed** after May 21, 1948, effective date of the law. (Renegotiation Act of 1948).

▶ **Forget It**—Small contractors who do less than $100,000 worth of procurement business within any single fiscal year therefore can, generally speaking, forget about renegotiation problems until they grow into a bigger business category.

Powers for administering renegotiation have been delegated by the Secretary of Defense to a Military Renegotiation Policy and Review Board, headed by Frank L. Roberts, chairman, with offices in the Pentagon Bldg. (Room 4E937).

▶ **Advises Johnson**—This board is made up of the three chairmen of three second-echelon renegotiation boards, one for each of the Armed Services. The top board acts as advisers to Secretary of Defense Louis Johnson on renegotiation matters, and sits in review on appeals by contractors on decisions by the service boards. It also assigns contractors to whichever service board has jurisdiction over them, and in cases of joint procurement, decides which service board shall handle a specific case.

The Policy and Review Board sends out report forms resembling income tax return forms, to companies which it has reason to believe have done enough business in 1948 or 1949 fiscal years to warrant renegotiation.

▶ **Board Letter**—A letter accompanying the forms states in part:

"The purpose of this letter is to obtain information which will enable the Military Renegotiation Policy and Review Board to determine whether renegotiation proceedings should be conducted with your concern.

"If you had gross receipts or accruals from renegotiable business which aggre-

gated $100,000 or more in your latest fiscal year, the filing of the inclosed 'Standard Form of Contractor's Report' is required. In such case this report must be filed on or before the last day of the fifth month following the close of your fiscal year.

"If your receipts or accruals from renegotiable business did not aggregate $100,000 for your fiscal year you are not subject to renegotiation for such year and the 'Standard Form of Contractor's Report' need not be filed. It will be very helpful to the Board however to have such fact reported on the inclosed form entitled 'Statement of Contractor, Non-applicability of the Renegotiation Act of 1948.'

"Neither this letter nor your reply will constitute the commencement of renegotiation proceedings. Upon receipt of the "Standard Form of Contractor's Report' a determination will be made as to whether such proceedings are necessary. The filing of this report satisfies the requirements of Paragraph 422.222 of the Military Renegotiation Regulation . . . ." Paragraph 422.222 MRR. gives further requirements about the form and is supplied in the "kit" mailed to the contractor together with other applicable regulations and the basic law.)

▶ **Five Months**—Five month deadline indicated in the letter for filing the report is not an absolute one but can be extended by the board if special circumstances are cited by the contractor.

Some time ago the board announced that it had granted an extension generally to contractors whose fiscal year ended between May 21, 1948 and Jan. 31, 1949. The extension permitted filing of reports anytime before July 31, 1949.

▶ **Audit Books**—The service boards and the top board have authority to audit the books and records of any contractor subject to the act, if they decide it is necessary after examining first forms returned.

Scope of the renegotiations is indicated by the fact that the board sent out forms to 1200 companies for reports, for the 1949 fiscal year, although only contracts let after May 21 of that year were subject to renegotiation.

▶ **Report Form**—The contractor's report form is a statement of his estimated business for the year, estimated profits, product sold or service rendered, and is to be accompanied by his income tax return, a profit and loss statement, statement of surplus and balance sheet at the close of his fiscal year.

In an effort to let the aircraft industry know what contracts are considered as subject to renegotiation the Roberts board periodically publishes lists of contractors and contracts which are believed to fall under that category. They

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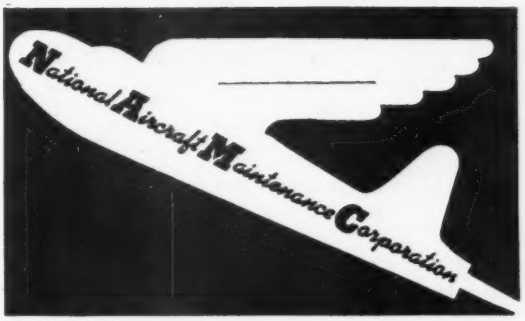

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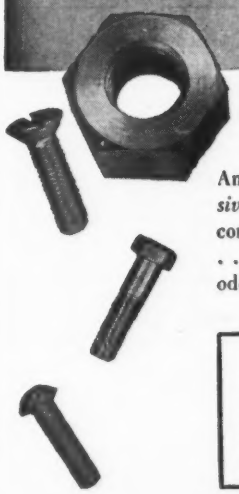

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may be found in the Federal Register, and are usually carried in the Production section of AVIATION WEEK. (For example, see AVIATION WEEK, May 23 and 30.)

► **Change Expected**—Legislation now pending in Congress is expected to extend the Renegotiation Act as it applies to the fiscal 1950 year.

Major changes, already embodied in the Senate version of an amendment, and which are likely to survive the final Senate-House conference on the measure would make renegotiation applicable to:

► **Negotiated Contracts**—"All negotiated contracts in excess of $1,000 entered into during the fiscal year 1950 by or on behalf of the Department of the Army, the Department of the Navy or the Department of the Air Force for 1. ships; 2. aircraft and aircraft parts; 3. guided missiles and parts; 4. arms, armor, armament and ammunition; 5. electrical, photographic, electronic, fire control and hydraulic equipment of special military application; 6. other technical or specialized equipment and parts to be designated by the Secretary of Defense whenever in his judgment the best interests of the U. S. so requires; 7. construction of facilities or installations outside the continental U. S., and all subcontracts thereunder in excess of $1000."

The section would make such contracts "subject to the Renegotiation Act of 1948 in the same manner and to the same extent as if such contracts and sub-contracts were required by such Act to contain the renegotiation article prescribed in subsection A of such act." And it provides that contracts made subject to renegotiation by the section will contain an article stating that they are subject to the Renegotiation Act of 1948.

► **Exemptions**—The section further would provide that the Secretary of Defense, "in exercising his discretion to exempt subcontracts, will take into consideration competitive conditions affecting sale of any article covered and protection of the Government against excess profits, and will exempt sub-contracts if he finds exemption in the public interest."

Another important sub-section of the amendment would eliminate effect of profit limitation provisions of the Vinson-Trammel Act on any contract or sub-contract subject to the Renegotiation Act of 1948.

► **One or Other**—It is considered virtually impossible to handle renegotiation proceedings on contracts which are also subject to the Vinson-Trammel Act since renegotiation is based on a fiscal year business report, and not broken down into individual contracts, as the Vinson-Trammel procedure requires.

The coming year is expected to see determination of a considerable number of renegotiation cases, and granting of a number of exemptions as well. Groundwork for the "never pleasant" task of re-examining last year's profits is pretty well defined now in the renegotiation regulations, and as soon as the Congress agrees on the form of the new amendment additional problems will be solved.

► **Change Orders**—One specific factor that is causing considerable industry anxiety is the status of change orders on contracts entered into prior to the May 21, 1948 deadline. Regulations provide that subsequent change orders are subject to renegotiation if they pro-

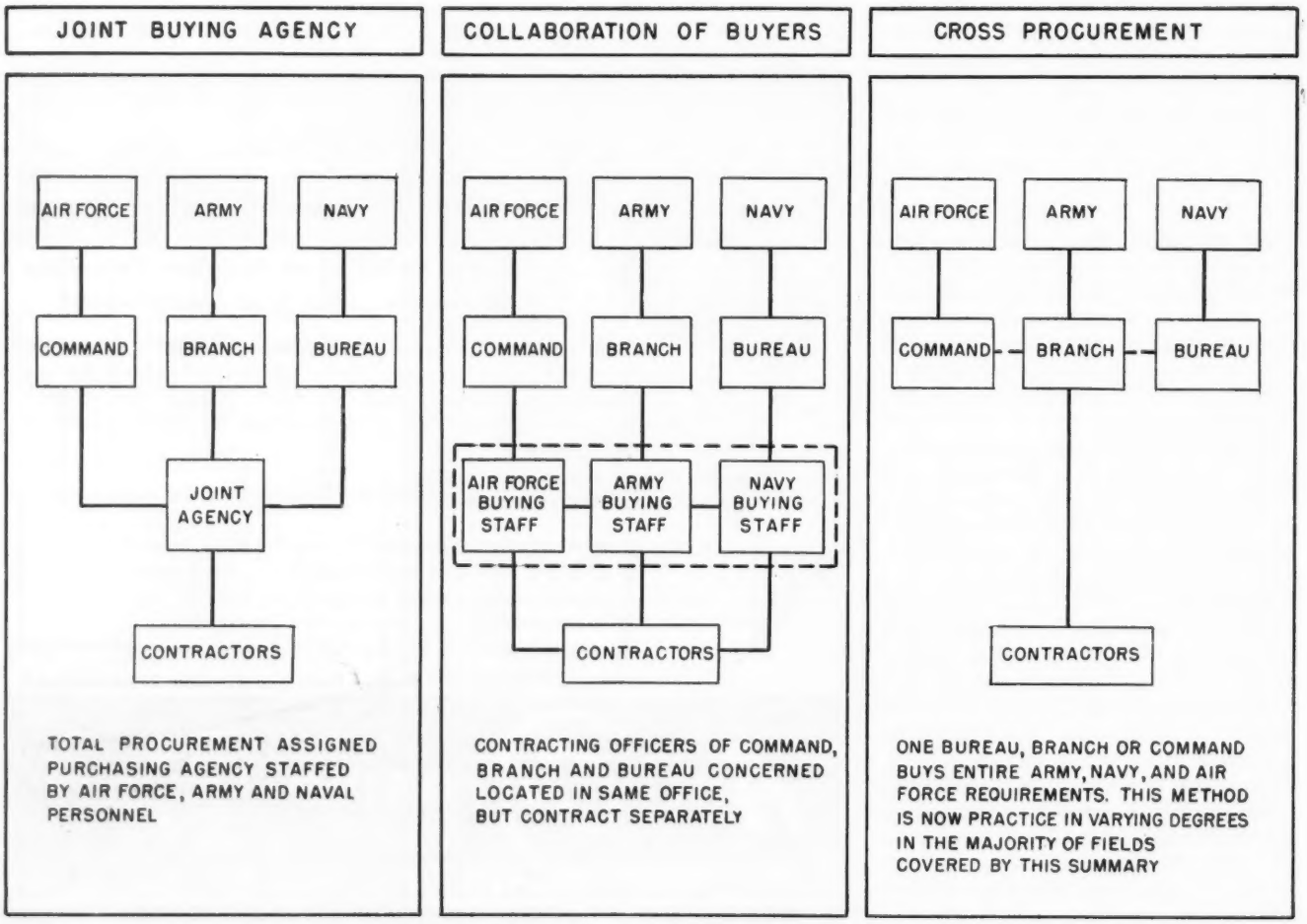

Chart illustrates the mechanics of three types of coordinated procurement.

vide for new or additional procurement or are made under the authority of the National Defense Appropriations Act of 1948. Industry spokesmen have asked for further clarification of this requirement to provide that only change orders which increased the quantity called for or added a new item to the contract would be subject to renegotiation.

Early Procurement Worried About Flints

Search of early records discloses that probably the first U. S. Military Procurement was authorized on the same day that the Continental Congress voted adoption of the Declaration of Independence, July 4, 1776. It was an authorization to buy flints for muskets and pistols.

On that same date the Congress passed the following resolution:

"That the Board of War be empowered to employ such a number of persons as they shall find necessary to manufacture flints for the continent, and for this purpose to apply to the respective Assemblies, Conventions, and Councils or Committees of Safety of the United American States, or committes of inspection of the counties and towns thereunto belonging, for the names and places of abode of persons skilled in the manufacture aforesaid, and of the places in their respective States where the best flint-stones are to be obtained, with samples of the flint-stones."

Communications and Electronics Group

A three-man Munitions Board group will have responsibility for all planning for current procurement and mobilization production of communications and electronics equipment.

The group—Joint Communications and Electronic Equipment Committee—will not conflict with the Communications and Electronic Committee under the Joint Chiefs of Staff, but will be responsible for industrial mobilization rather than strategic planning.

Chairman of the committee is Maj. Gen. Patrick W. Timberlake, USAF, Director for Military Programs, Munitions Board.

Members of the committee are:

• **Army**—Brig. Gen. Harry Reichelderfer, USA, Commanding General, Signal Corps Engineering Laboratory, Fort Monmouth, N. J.; alternate, Col. Eugene V. Elders, USA, Signal Corps, assistant chief of procurement and distribution, Office of the Chief Signal Officer, Washington, D. C.

• **Navy**—Rear Adm. Rico W. Botta, USN, assistant chief, Office of Naval Materiel, Washington, D. C.; alternate, Capt. C. A. Rumble, USN, Office of Naval Operations, Washington, D. C.

• **Air Force**—Maj. Gen. F. H. Griswold, USAF, assistant deputy, chief of staff, materiel; alternate, Col. Leigh H. Hunt, USAF, chief, industrial planning division, Air Force, Washington, D. C.

The committee will be served by a secretariat to which each of the three military departments will assign a director, and by a staff of industrial specialists.

Exemptions and Definitions

Renegotiation exemptions are for all military contracts prior to May 21, 1948; tax-exempt charitable, religious and government institutions and subcontracts under a prime or other sub-contract that is exempt. The Secretary of Defense, Secretaries of Air Force, Navy and Army, and the Review Board have authority to exempt individual contractors when they determine exemption is justified.

Generally speaking, a contract or subcontract for a machine or material is renegotiable if that item is used:

• **To produce** or otherwise operate directly on an end product or an article included in an end product, by chemical, physical or mechanical methods—such as shaping, cutting, constructing, combining, refining, assembling, testing, inspecting, or in the case of the end product, packaging. This includes not only such machinery as rolling mills and machine tools, but also gauges and other measuring instruments.

• **To transport** within the contractor's plant an end product or article incorporated in it, or other articles used in connection with production, including such items as tractors, trucks, and traveling cranes.

• **In connection** with the repair, maintenance, equipping, or operation of the contractor's plant or machinery or equipment used in production, including spare parts, auxiliary tools, abrasives, wrenches, screwdrivers, hand tools or equipment located in the tool room of a contractor's plant, and special equipment used for the manufacture, preparation or maintenance of tools, dies, jigs, fixtures, equipment or various machinery.

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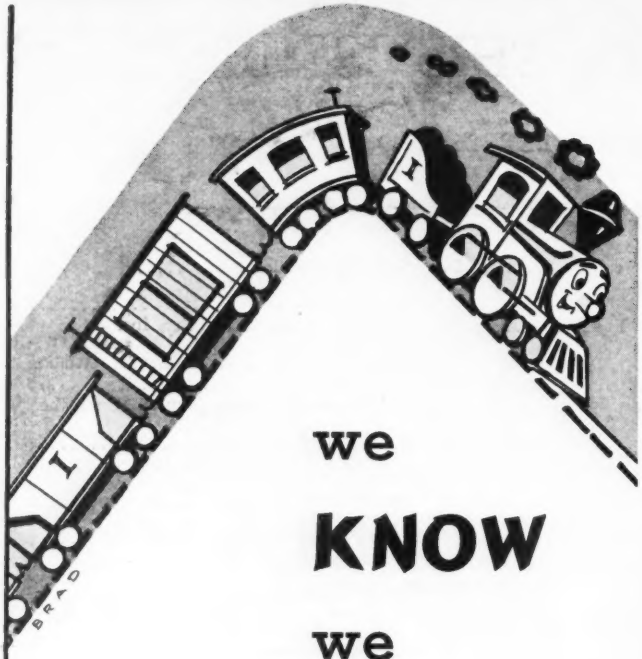

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Procurement Bibliography

Individuals and firms interested in military procurement will find much useful information about government contracts and purchasing in the following publications, which may be obtained as indicated:

• A Guide for Selling to the United States Air Force, 1949, obtainable from the Contractors' Relations Branch, Procurement Division, Air Materiel Command headquarters, Wright-Patterson AFB, Dayton, Ohio or at the Procurement Information Center, Pentagon, Washington 25, D. C.

• Purchased Items and Purchasing Locations of the Department of the Army, July, 1949, a Pamphlet designed to assist small business, obtainable from the Procurement Information Center, Pentagon, Washington 25, D. C.

• Buying A Navy, a guide showing Navy procurement procedure, obtainable from U. S. Navy or Procurement Information Center, Washington 25, D. C. (New revised edition in preparation.)

• List of Principal Purchasing Offices of Army, Navy, Air Force and Marine Corps, obtainable from Procurement Information center, with notification as to which office procures the types of products listed in letter of inquiry.

• Index of USAF Catalogs of Items purchased and copies of selected catalogs of items, classified as to types, obtainable from Air Materiel Command headquarters, Wright-Patterson AFB, Dayton, Ohio, Attention MCPPXS72.

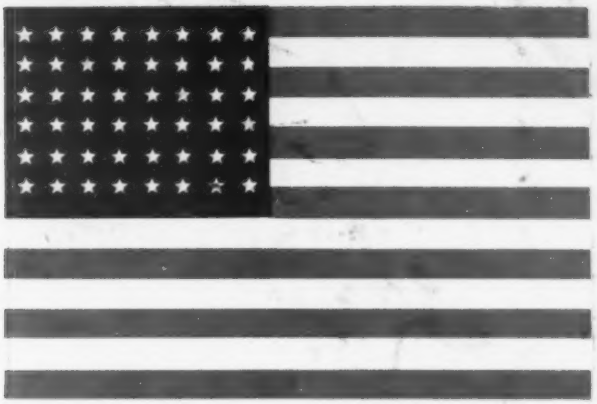
• Armed Services Procurement Regulations, Parts 1-15, obtainable from Superintendent of Documents, Government Printing Office, Washington 25, D. C.

• Federal Register, which contains regulations of government agencies including procurement regulations, as they are promulgated, obtainable from Superintendent of Documents, Government Printing Office, Washington 25, D. C.

• Public Law 413, the Armed Services Procurement Act, 80th Congress, 1947, is still the basic law governing military procurement, is obtainable free from House Document Room, Capitol, Washington, D. C.

• Index of Specifications and Bulletins Approved for U. S. Air Force Procurement, obtainable from Procurement Division, Air Materiel Command headquarters, Wright-Patterson AFB, Dayton, Ohio. (Note: No action will be taken on requests for restricted information from agencies which the Government considers not authorized to receive such information.)

• Military Renegotiations Regulations under Renegotiation Act of 1948, Part 423, Determination of Renegotiable Business and Costs, obtainable from the Military Renegotiation Policy and Review Board, Office of the Secretary of Defense, Washington 25, D. C.



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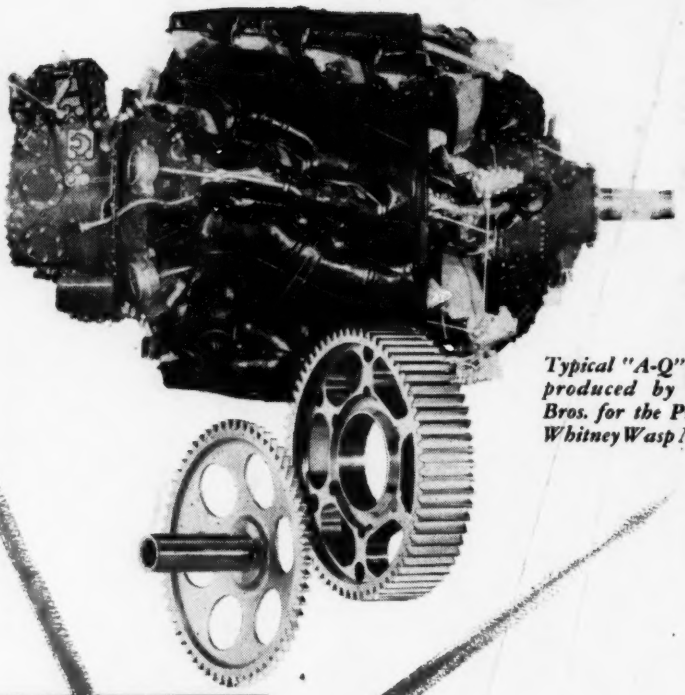

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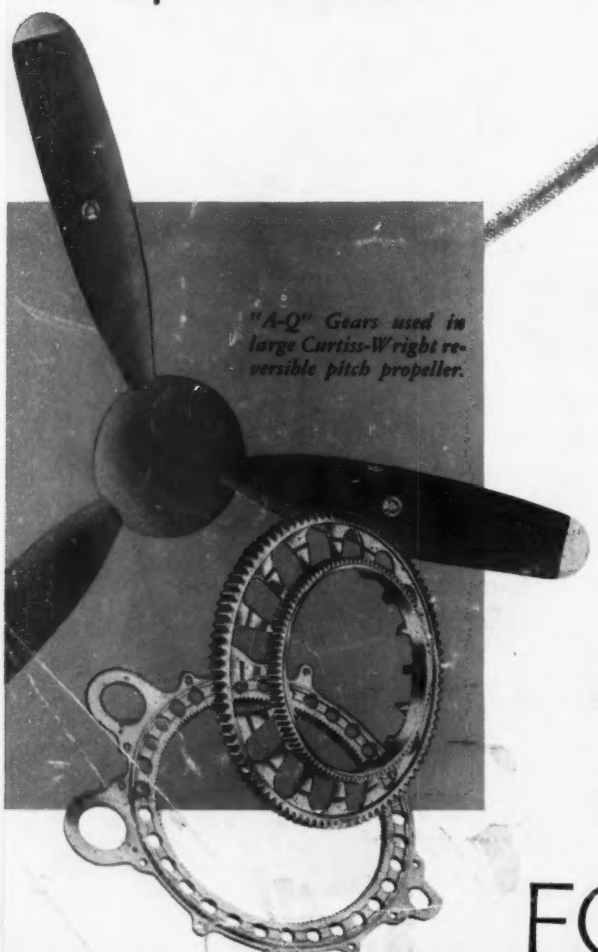

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